

1-1988

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St. Mary's 114

Graduate Issue  
University of Dayton  
Bulletin 1988



*making our best better*

UNIVERSITY OF  
**DAYTON**



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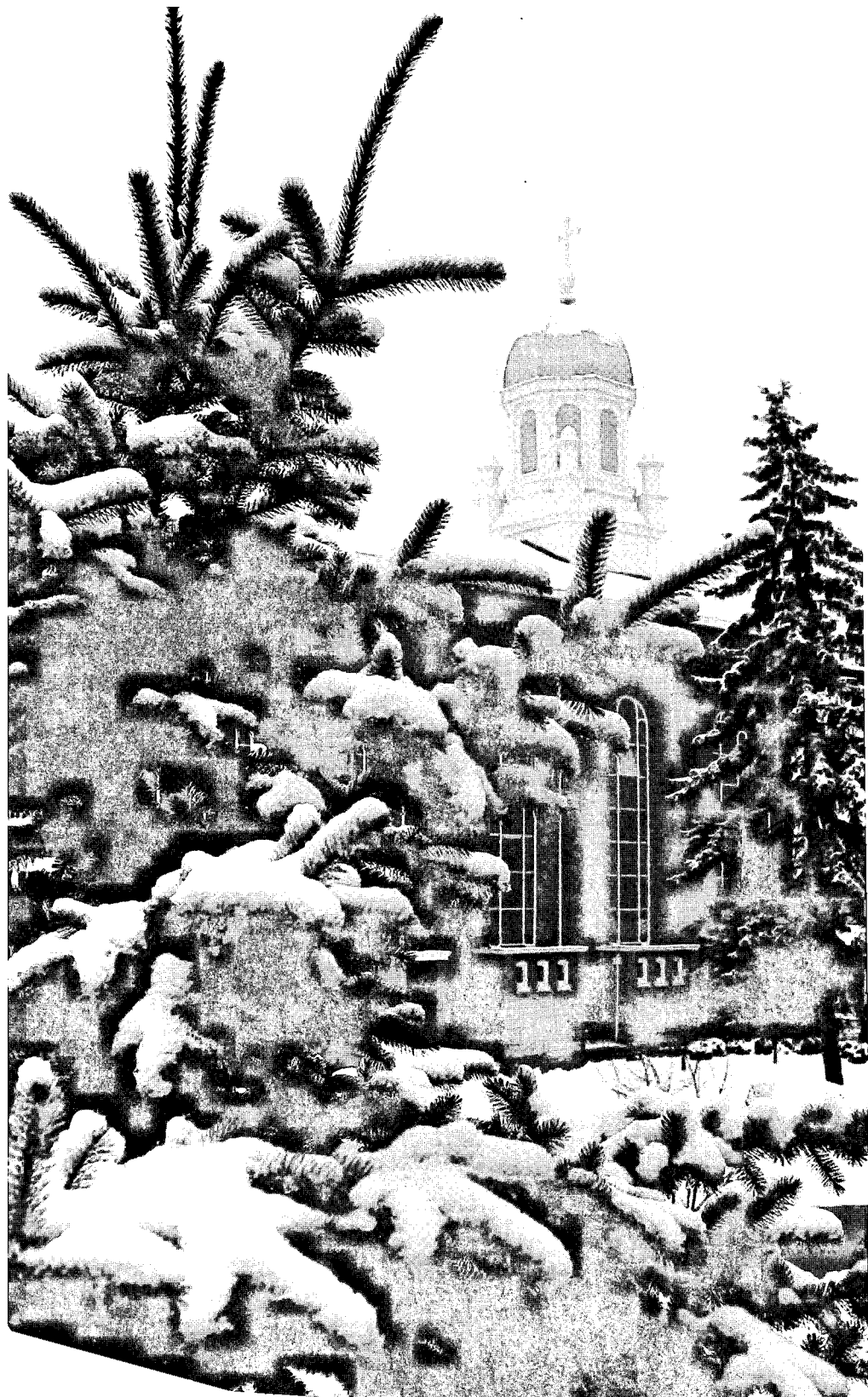
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# **1987-88 ACADEMIC CALENDAR**

## **SECOND TERM**

### **DECEMBER**

30, Wednesday

Last day to complete registration

### **JANUARY**

4, Monday

Classes begin at 8:00 a.m.

12, Tuesday

Last day to change schedules

18, Monday

Martin Luther King Day — Faculty Workshop — no day or evening classes except those held only once weekly at 4:30 p.m. and after

22, Friday

Last day to change first term grades

25, Monday

Last day to withdraw without record

### **FEBRUARY**

5, Friday

Last day to submit candidacy for graduation

15, Monday

Lincoln-Washington Day — no day or evening classes except those held only once weekly at 4:30 p.m. and after

16, Tuesday

Midterm Break — no day or evening classes except those held only once weekly at 4:30 p.m. and after

### **MARCH**

31, Thursday

Easter recess begins after 3:00 p.m. classes

### **APRIL**

2, Saturday

Saturday MBA classes meet

4, Monday

Monday classes at 4:30 p.m. or after will meet

8, Friday

General Faculty Meeting, 3:00 p.m.

16, Saturday

Examinations for Saturday-only classes

18-22, Monday-Friday

Examinations

24, Sunday

Commencement

25, Monday

Grades due in Registrar's Office at 9:00 a.m.

### **JUNE**

3, Friday

Last day to change second term grades

## **THIRD TERM — First Session**

### **APRIL**

29, Friday Last day to complete registration

### **MAY**

2, Monday Classes begin at 8:00 a.m.  
5, Thursday Last day to change schedules  
11, Wednesday Last day to withdraw without record from first session courses  
12, Thursday Feast of Ascension — no classes — MBA evening classes meet  
30, Monday Memorial Day—no classes  
31, Tuesday Last day to withdraw without record from full third term courses

### **JUNE**

3, Friday Last day to change second term grades  
11, Saturday Examinations for Saturday-only classes  
13-14, Monday-Tuesday Examinations; first session ends after last examination  
17, Friday Grades due in Registrar's Office at 9:00 a.m.

### **JULY**

14, Thursday Last day to change first session grades

## **THIRD TERM — Second Session**

### **JUNE**

15, Wednesday Last day to complete registration  
16, Thursday Classes begin at 8:00 a.m.  
21, Tuesday Last day to change schedules  
22, Wednesday Last day to submit candidacy for graduation  
27, Monday Last day to withdraw without record from second session courses

### **JULY**

4, Monday Independence Day—no classes  
14, Thursday Last day to change first session grades  
23, Saturday Examinations for Saturday-only classes  
27-28, Wednesday-Thursday Examinations  
31, Sunday Diploma exercises

### **AUGUST**

1, Monday Grades due in Registrar's Office at 9:00 a.m.

# 1988-89 PROPOSED ACADEMIC CALENDAR

## FIRST TERM

### AUGUST

24, Wednesday

Classes begin at 8:00 a.m.

### SEPTEMBER

5, Monday

Labor Day-no classes

### OCTOBER

10, Monday

Columbus Day-no day or evening classes except those held only once weekly at 4:30 p.m. and after

### NOVEMBER

24-25, Thursday-Friday

Thanksgiving recess

### DECEMBER

8, Thursday

Feast of the Immaculate Conception — no classes

10, Saturday

Examinations for Saturday-only classes

12-16, Monday-Friday

Examinations

17, Saturday

Diploma exercises

## SECOND TERM

### JANUARY

4, Wednesday

Classes begin at 8:00 a.m.

16, Monday

Martin Luther King Day — Faculty Workshop — no day or evening classes except those held only once weekly at 4:30 p.m. and after

### FEBRUARY

20, Monday

Lincoln-Washington Day—no day or evening classes except those held only once weekly at 4:30 p.m. and after

21, Tuesday

Midterm Break—no day or evening classes except those held only once weekly at 4:30 p.m. and after

### MARCH

22, Wednesday

Easter recess begins after last evening class

26, Sunday

Easter

28, Tuesday

Classes resume

### APRIL

24-28, Monday-Friday

Examinations

30, Sunday

Commencement

### **THIRD TERM — First Session**

#### **MAY**

8, Monday  
29, Monday

Classes begin at 8:00 a.m.  
Memorial Day—no classes

#### **JUNE**

16-17, Friday-Saturday      Examinations

### **THIRD TERM — Second Session**

#### **JUNE**

16, Friday

Classes begin at 8:00 a.m.

#### **JULY**

3 or 4, Monday or  
Tuesday  
28-29, Friday-  
Saturday  
30, Sunday

Independence Day — no classes

Examinations  
Diploma exercises

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# I THE UNIVERSITY OF DAYTON

Founded in 1850

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The University of Dayton is a private, coeducational school founded and directed by the Society of Mary (the Marianists), a Roman Catholic teaching order.<sup>1</sup> It is among the nation's largest Catholic institutions of higher learning. Aware of the cultural richness of diversity, the University numbers among its students and faculty representatives of many faiths. For the same reason, the University has consciously drawn its students and faculty not only from the immediate community and adjoining states but from across the country and from numerous foreign countries.

The main campus is seventy-six landscaped acres on a hill overlooking the city of Dayton, Ohio. The buildings are a pleasantly eclectic architectural mixture of old and new. The faculty is well-qualified and competent to provide students with superb instruction and prudent counseling.

A lively, friendly atmosphere; reasonable tuition rates; financial aid plans; numerous and varied religious, cultural, and social opportunities; an early-semester calendar allowing a number of study-recess options; intercollegiate and intramural athletic programs for both men and women; academic options such as interdisciplinary programs, field study and internships, academic, professional, and personal counseling; cooperative work-study plans; a placement service for students and graduates — these exemplify the many aspects of the character of the University of Dayton.

## BRIEF HISTORY

In March 1850, Marianist Father Leo Meyer, recently arrived from France, purchased Dewberry Farm in Dayton from John Stuart, a descendent of the old royal family of Scotland. The University of Dayton had its earliest beginnings here on July 1, 1850 when St. Mary's School for Boys, a frame building that not long before had housed farm hands, opened its door to fourteen primary students from Dayton.

By 1860, when Brother Maximin Zehler became president, enrollment approached one hundred. St. Mary's grew; an old history refers to the period of 1860-1875 as "the brick-and-mortar years." In 1870, visitors marveled at new St. Mary's Hall, the largest building in the city of Dayton, and called it Zehler's

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<sup>1</sup>The Society of Mary, founded in France in 1817 by Father William Joseph Chaminade, presently conducts schools throughout the United States and in Africa, Australia, Canada, Japan, Europe, and South America. The Society operates Chaminade College in Hawaii and St. Mary's University in San Antonio, Texas.



Folly. But when the "college department" moved into it in 1871, it proved not too big at all. Construction went on.

Known at various times as St. Mary's School, St. Mary's Institute, and St. Mary's College, the school established its present identity in 1920, when it was incorporated as the University of Dayton. The same year the University started its tradition of evening and Saturday classes, to serve the adult members of the surrounding community. In 1922, a School of Law opened, also with evening classes. Other graduate programs followed. In 1923, the first summer session took place, its classes open to women as well as men. This decade of academic growth and innovation was also a time of increased emphasis on sports here and across the country. Sports, however, were no novelty here: in 1874, for example, St. Mary's Institute's new gymnasium was the only one of its kind in Ohio, and tradition holds that the first organized basketball game in the state took place there.

The 1930's and the early 1940's, for obvious reasons, were in many ways a time of retrenchment for the University of Dayton as for most other schools. In 1935, even as it closed its preparatory school and graduated its last class from the old law school, the University inaugurated a college for women, with sisters of Notre Dame in charge of 27 entering students. Two years later, the college for women closed, the deans opened all divisions to women, and the University of Dayton became co-educational.

Today, the University of Dayton is a modern comprehensive university consisting of the College of Arts and Sciences, the School of Business Administration, the School of Education, the School of Engineering and the Division of Engineering Technology, the School of Law, and the Research Institute.

Advanced degrees are given in the College and all Schools. The University of Dayton is accredited as a comprehensive university and is listed in the top 100 research universities in the United States.

## **STATEMENT OF PURPOSE**

A graduate school, through its faculty, seeks to create and maintain the academic milieu for excellence in graduate work. Therefore, its influence and encouragement extend first to its own members and their scholarly activities. Because it conceives as the form and substance of graduate work not the credits accumulated but the mastery of a subject and the understanding of its relationship to kindred subjects, the graduate school seeks further to impart to its students thorough knowledge in academic fields, special skills in research, and sharpened powers of independent thought. Yet, while it gives them the resources, the guidance, and the inspiration of a scholarly staff in its classrooms, laboratories, and libraries, it expects the students themselves to bring marked initiative and energies to their work and to assume full responsibility for the progress of their studies.

In short, graduate work, for the student at the University of Dayton, has for its purpose an integrated program of advanced study based on adequate undergraduate preparation in a specific field. It presupposes academic and personal maturity and makes more than an average demand upon the

initiative, the industry, and the scholarship of the candidate for an advanced degree.

The official statement of purposes of the University of Dayton was approved by the Board of Trustees May 14, 1969:

The University of Dayton, by tradition, by legal charter, and by resolute intent, is a church-related institution of higher learning. As such, it seeks, in an environment of academic freedom, to foster principles and values consonant with Catholicism and with the living traditions of the Society of Mary. Operating in a pluralistic environment, it deliberately chooses the Christian world-view as its distinctive orientation in carrying out what it regards as four essential tasks: teaching, research, serving as a critic of society, and rendering public service.

The University of Dayton has as its primary task to teach — that is, to transmit the heritage of the past, to direct attention to the achievements of the present, and to alert students to the changes and challenges of the future. It regards teaching, however, as more than the mere imparting of knowledge; it attempts to develop in its students the ability to integrate knowledge gained from a variety of disciplines into a meaningful and viable synthesis.

The University of Dayton holds that there is harmony and unity between rationally discovered and divinely revealed truths. Accordingly, it commits its entire academic community to the pursuit of such truths. It provides a milieu favorable to scholarly research in all academic disciplines, while giving priority to studies which deal with problems of a fundamentally human and Christian concern. It upholds the principle of responsible freedom of inquiry, offers appropriate assistance to its scholars, and endeavors to provide the proper media for the dissemination of their discoveries.

The University of Dayton exercises its role as critic of society by creating an environment in which faculty and students are free to evaluate, in a scholarly manner, the strengths and weaknesses found in the institutions developed by man. While as an organization it remains politically neutral, objective and dispassionate, it encourages its members to judge for themselves how these institutions are performing their proper tasks; to expose deficiencies in their structure and operation; to propose and to actively promote improvements when these are deemed necessary.

The University of Dayton recognizes its responsibility to support, with means appropriate to its purposes, the legitimate goals and aspirations of the civic community and to cooperate with other agencies in striving to attain them. It assists in promoting the intellectual and cultural enrichment of the community; it makes available not only the resources that it possesses, but also the skills and techniques used in the accumulation and dissemination of knowledge. Above all, it strives to inspire persons with a sense of

community and to encourage men and women of vision who can and will participate effectively in the quest for a more perfect human society.

## **ADMINISTRATIVE STRUCTURE**

The University of Dayton includes the College of Arts and Sciences and four professional schools: the School of Business Administration, the School of Education, the School of Engineering (including Engineering Technology), and the School of Law. The Deans, through their departments, administer the undergraduate and graduate programs. The Associate Provost has the overall responsibility for all graduate programs, and also administers all research activities connected with the University. The administrative head for academic affairs is the Vice President for Academic Affairs and Provost.

## **ACADEMIC YEAR**

The University of Dayton operates an early semester, split third-term calendar. The academic year begins with the fifteen-week fall term, which ends before Christmas. The winter term, also fifteen weeks, begins in January and ends late in April. The third, or spring-summer term, is split into two complete sessions of six weeks each.

The advantages of such a calendar are many. Students may enroll for the traditional fall and winter semesters and have a four-month summer vacation; or they may add half terms or full terms to enrich their programs or speed the completion of their graduate requirements. The University holds graduation ceremonies at the end of each term. Students who are employed have extra time in spring and summer; or they may enroll for the third term and work during the fall or winter term.

## **ACCREDITATION**

The Accreditation Board for Engineering and Technology, Inc., for the programs in chemical, civil, electrical, and mechanical engineering and in electronic, industrial, and mechanical engineering technology  
The American Assembly of Collegiate Schools of Business for the baccalaureate programs of the School of Business  
American Bar Association for its School of Law  
Association of American Law schools for its School of Law  
National Association of Schools of Music  
National Council for Accreditation of Teacher Education  
North Central Association of Colleges and Schools  
State of Ohio Department of Education

The University has the approval of the following:

American Chemical Society for its program in Chemistry  
American Dietetic Association for Plan IV (Program S7) in  
Human Ecology

American Medical Association for its Premedicine program  
Council on Social Work Education  
National Association for Music Therapy  
Ohio League of Law Schools for its School of Law

The University of Dayton is officially accredited by the following agencies:

Accreditation Board for Engineering and Technology, Inc., for chemical, civil, electrical, and mechanical Engineering curricula and for Baccalaureate programs in electronic, industrial, and mechanical engineering technology

American Assembly of Collegiate Schools of Business for the Baccalaureate programs of the School of Business.

## **INSTITUTIONAL MEMBERSHIPS**

The University holds institutional membership in the following:

The Academy of Criminal Justice Sciences  
American Assembly of Collegiate Schools of Business  
American Association for Higher Education  
American Association of Colleges for Teacher Education  
American Association of Collegiate Registrars and Admissions Officers  
The American Association of University Administrators  
American Association of University Women  
American Council on Education  
American Home Economics Association  
American Library Association  
The American Society of Criminology  
American Society for Engineering Education  
Association of American Colleges  
The Association of American Law Schools  
Association of Catholic Colleges and Universities  
Association of Colleges and Universities Housing Officers  
Association of Governing Boards of Universities and Colleges  
Association of Independent Colleges and Universities of Ohio  
Catholic College Coordinating Council  
College Entrance Examination Board  
College and University Personnel Association  
Comparative and International Education Society  
Cooperative Education Association  
Council for Support and Advancement of Education  
Council for the Advancement of Experimental Learning  
Council of Graduate Schools  
Council on Social Work Education  
Dayton Area Chamber of Commerce  
Dayton Art Institute (sponsoring)  
Institute of International Education  
League of Ohio Law Schools  
Midwest Association of Graduate Schools  
National Association for Foreign Student Affairs  
National Association of Independent Colleges and Universities  
National Association of Student Personnel Administrators  
National Catholic Education Association  
National Council of Catholic Bishops

National Scholarship Service and Fund for Negro Students  
North Central Association of Colleges and Schools  
North Central Conference on Summer Schools  
Ohio Academy of Science  
Ohio Association of Colleges for Teacher Education  
Ohio Association of Private Colleges for Teacher Education  
Ohio College Association  
Ohio Continuing Higher Education Association  
Regents Advisory Committee on Graduate Study  
Society for the Advancement of Education  
Southwestern Ohio Council for Higher Education

## **RELATED UNIVERSITY SERVICES**

Besides the regular day sessions, the University conducts special as well as regular evening and summer sessions and offers short-term workshops, institutes, and conferences. Many of the programs presented during the regular day sessions are offered also in the evening and summer sessions, enabling students to work toward degrees on a part-time basis. All credited courses, whenever offered or in whatever form, conform to the same standards and are governed by the same policies and regulations which apply to regular day sessions.

The Continuing Education Office especially serves the part-time students of the Dayton community, to make the University and its course offerings, both credit and noncredit, more easily available to them. Similarly, the Office of International Education Services serves students from other countries who are enrolled at the University as well as those students who are interested in traveling or studying in other countries.

## **OFF-CAMPUS ACADEMIC CENTERS**

The University of Dayton maintains off-campus centers, all of them in Ohio, for graduate study in: Business Administration (Columbus); Education (Lima, Springfield, and Steubenville); Religious Studies (Columbus) and Political Science (WPAFB). All programs and courses are closely supervised by the Deans of Education and Business as well as the Dean for Graduate Studies and Research. Most of these courses are taught by the faculty teaching the same course on the main campus.

## **INSTITUTIONAL CONSORTIA**

### **Dayton-Miami Valley Consortium**

Fifteen institutions of higher learning in the Miami Valley, including the University of Dayton, have organized the Dayton-Miami Valley Consortium (DMVC). The participating institutions seek to increase inter-institutional cooperation, improve curricula, develop new courses and programs, share library sources, minimize cost, and centralize functions, by using computers, modern educational technology, and communication media.

The Consortium invites regularly enrolled full-time students at one institution, under certain conditions, to register for credit at no additional charge in courses

offered by other Consortium institutions in which no instruction is available at their own institution.

## **Consortium for Higher Education Religion Studies**

The University is an active member of the Consortium for Higher Education Religion Studies (CHERS). This consortium makes possible cross registration, sharing library resources, dialogue with students of other institutions, interchange of facilities, and cooperative innovative planning. Area members include Earlham School of Religion, Mount St. Mary's Seminary, Payne Theological Seminary, University of Dayton, and United Theological Seminary.

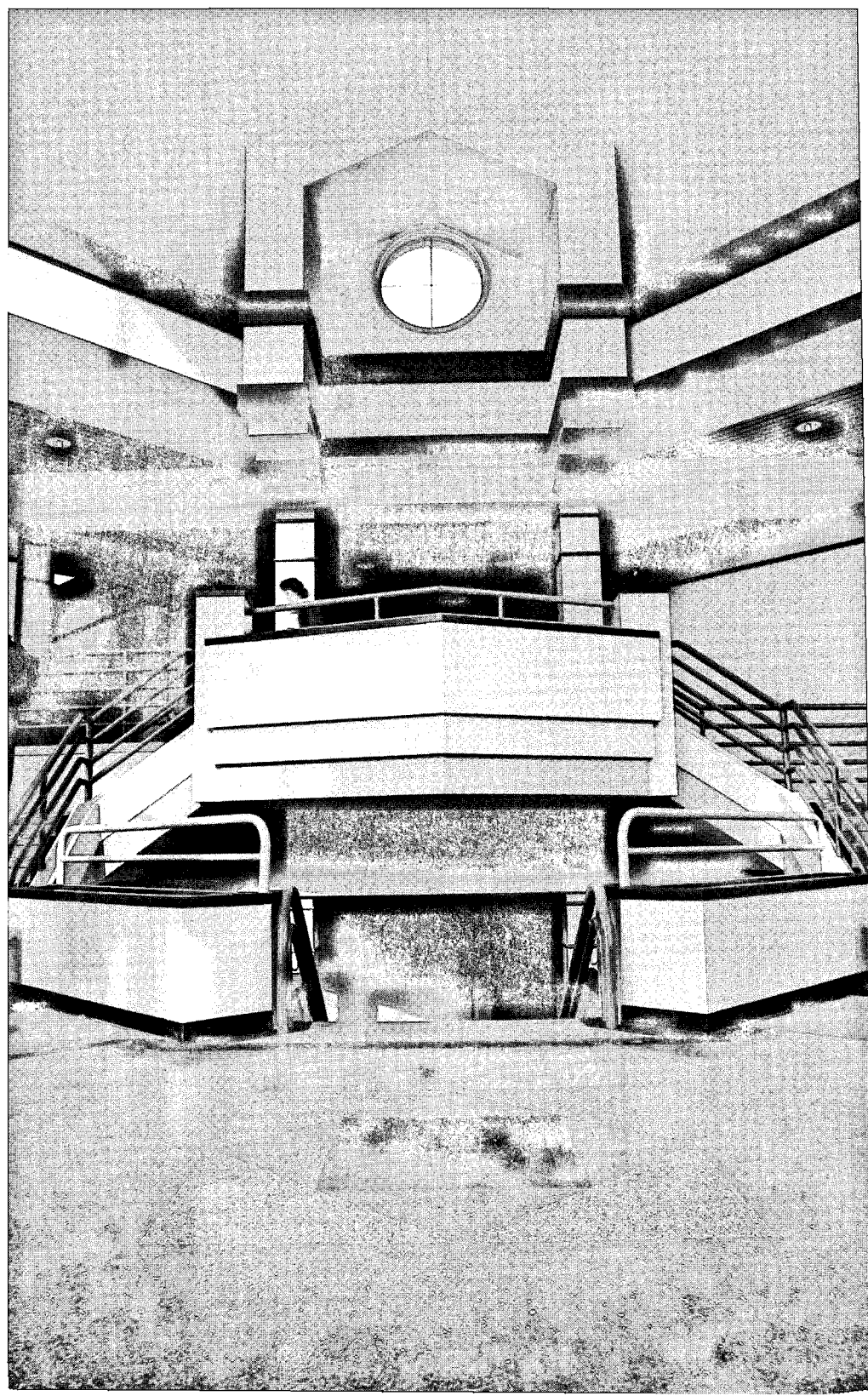
United Theological Seminary, Antioch College, the University of Dayton, and Wright State University jointly employ and share a Professor of Judaic Studies under a grant from the Harriet Sanders Trust of Dayton, Ohio.

The University of Dayton cooperates with the Pontifical Marianum University (Rome, Italy) in the conferral of the degree Doctor of Sacred Theology.

## **CAMPUS MINISTRY**

Campus Ministry seeks to lead the university in fostering a faith community among its members. This faith is manifested in personal and communal devotion to God, especially as revealed to Jesus Christ; in common worship; in the quality of relationships among the members of the community; and in efforts at enriching humanity and the world through the articulation of moral and religious values and their implementation.

In order to achieve this goal, Campus Ministry provides a number of services to all who are part of the university community. It cooperates with all segments of the University in fostering human development and the articulation and implementation of moral and religious values. It provides opportunities for prayer, for the celebration of the sacraments, for retreat experiences, and for pastoral counseling. It sponsors events, classes, and seminars that concern the deepening of faith, the awareness of human needs, and the practice of religious and moral values. It coordinates the efforts of more than fifteen student organizations that offer opportunities for community service. Though specifically Roman Catholic, it cooperates with and helps foster other religious groups on campus.



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## II FINANCIAL INFORMATION

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### GENERAL POLICY

One half of the tuition and fees must be paid at the time of final registration for the term; the remaining one-half must be in the Bursar's Office no later than six (6) weeks after the beginning of the term.

A late registration fee will be assessed if registration is finalized on the first day of the term and later. A late payment fee will be assessed if the second one-half payment is received in the Bursar's Office after the first six (6) weeks of the term.

### TUITION AND FEES\*

*\*Subject to change. See recent course composites for latest updates.*

#### Tuition for Courses Taken for Undergraduate Credit

Per registered semester hour for lecture course on campus only . .	\$163.00
Per clock hour for laboratory course . . . . .	30.00

#### Tuition for Courses Taken for Graduate Credit

Per registered semester hour except as below . . . . .	177.00
Department of Religious Studies, per semester hour . . . . .	133.00
Department of Religious Studies — Columbus, per semester hour . . . . .	133.00
School of Education, per quarter hour . . . . .	80.00
School of Education, Lima Academic Center, per quarter hour . . . .	85.00
School of Education, Capitol University, per quarter hour . . . . .	85.00
School of Education, Springfield Academic Center, per quarter hour . . . . .	85.00
School of Education, Steubenville Center, per quarter hour . . . . .	85.00
School of Education, Rio Grande, per quarter hour . . . . .	85.00
Ed.S. program, per quarter hour . . . . .	95.00
School of Engineering doctoral program, per semester hour . . . .	192.00
Secondary and elementary teachers and school administrators, per semester hour ( <i>school related courses only</i> ) . . .	133.00

#### Fees

Application fee, non-refundable . . . . .	20.00
Foreign student application fee, non-refundable . . . . .	50.00



Basic University fee, each term on campus only (This fee payable only once during the third term.)	20.00
Computer Science fee, per course	75.00
Special Course Fees	Vary
Audit per quarter hour - on campus	40.00
Audit per quarter hour - off campus	43.00
Audit per semester hour	89.00
Graduation fee	45.00
Late registration fee service charge	15.00
Late payment fee (second payment)	15.00
Transcript of credits, first copy of order	2.00
\$ .50 per each additional copy of same order	

An assessment of \$20.00 will be made for payment of tuition and fees by a bad check and cancellation of the student's registration will result until proper payment is made of tuition, fees, and special assessments.

***The University reserves the right to make changes in its tuition and fees for any or all graduate courses at any time. Current information should be obtained from current course composites, or by contacting the department in which the course is offered, or the Office for Graduate Studies, or the Registrar's Office.***

## CANCELLATION AND REFUNDS

Cancellations will be allowed only after the completion of the proper Drop-Add Form. For refund purposes the effective date of cancellation is the date the student submits the official Drop-Add form, not the last day the student attends class. The date that appears on the official Drop-Add form will be forwarded to the Bursar's Office, and that date will determine the amount of refund due, if any.

Students attending academic centers away from the main campus may write a letter to the appropriate Dean requesting withdrawal if a Drop / Add form is not available. Requests for refunds must be in writing and addressed to the Bursar.

Students who discontinue class attendance without officially completing the withdrawal procedures will be responsible for the full amount of the applicable tuition and fees.

Tuition charges for cancellations the first and second terms will be made according to the following schedule:

During the first week of classes	20%
During the second week of classes	40%
During the third week of classes	60%
During the fourth week of classes	75%
During and after the fifth week of classes	100%

Tuition charges for cancellations in either session of the split third term will be made according to the following schedule:

During the first week of classes	35%
During the second week of classes	70%
During or after the third week of classes	100%

## TRANSCRIPTS

A transcript of the permanent academic record is a confidential document to be released in compliance with the regulations of the Family Educational Rights and Privacy Act of 1974 as amended. The Registrar will issue transcripts upon a request signed by the student provided that no outstanding financial obligation to the University exists. All transcripts so requested require payment in advance. See "Fees" in Chapter II, Financial Information. Complimentary copies will be mailed to graduates within approximately six weeks after graduation.

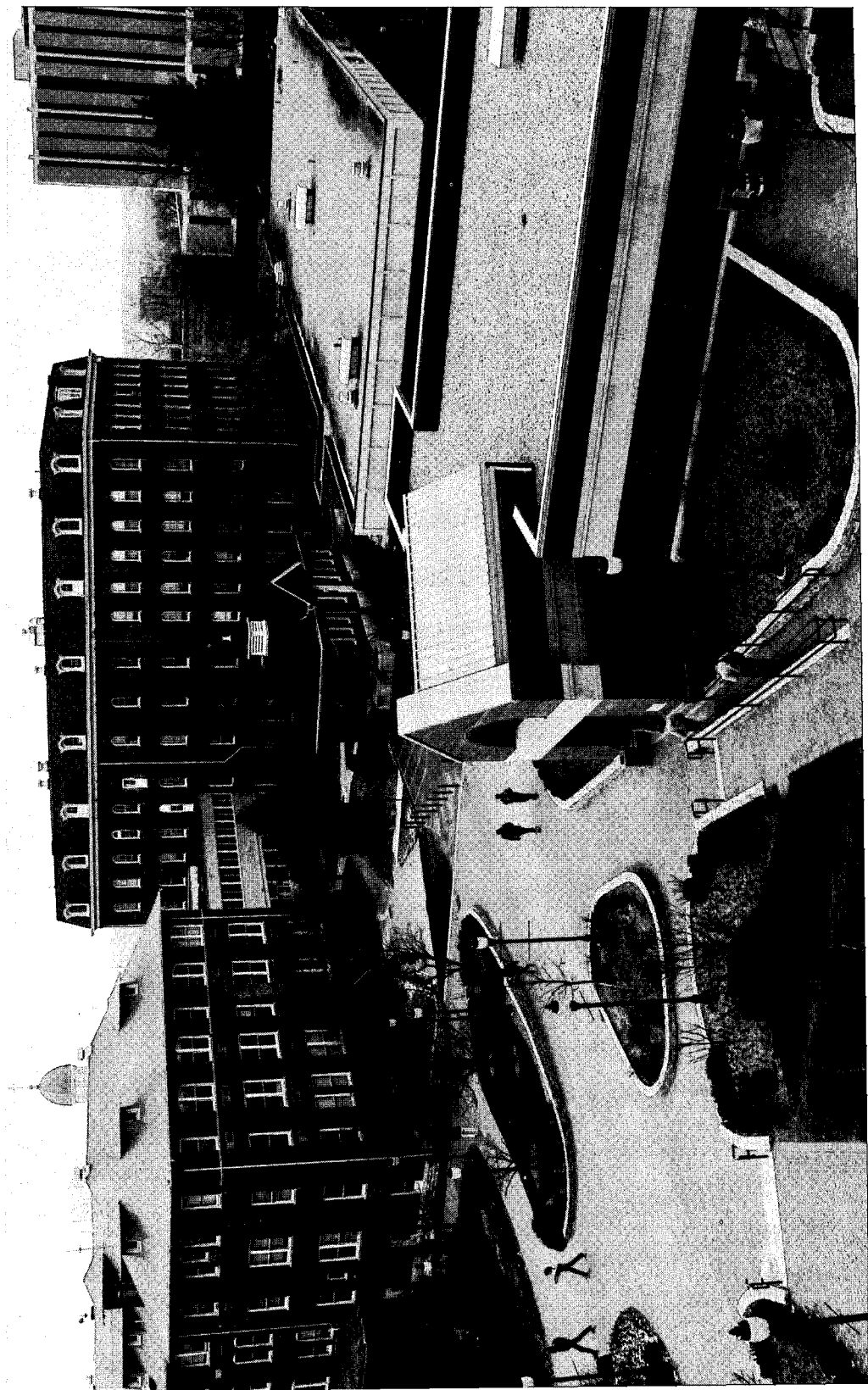
## ASSISTANTSHIPS AND FELLOWSHIPS

A limited number of graduate assistantships are available, in the College of Arts and Sciences, and Schools of Business, Education, and Engineering. These carry a stipend plus tuition remission for courses required in that degree. Recipients are expected to complete the master's degree in two years. Graduate Summer Fellowships for research and creative activities during the third term of the academic years are also available to graduate students who wish to devote that term to a research project.

Detailed information and application forms may be obtained from the chairperson or director of the desired graduate program.



*Willard Scott and Bryant Gumbel of Today*



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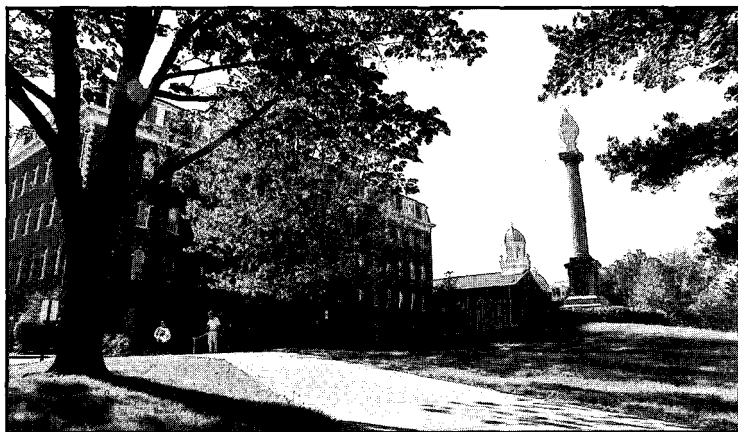
## III LIBRARIES AND RESEARCH SERVICES

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### ROESCH LIBRARY

The Roesch Library houses the book, journal, government document, and microfilm collections for both graduate and undergraduate students. Its volume holdings number over 850,000 and its journal titles almost 3,000. Through the OCLC online Union Catalog the library is interactive with the bibliographic holdings of over 2,500 other academic and research libraries across the country. The Roesch Library is fully automated through an integrated online catalog, circulation, and acquisitions/serials control system. Off-campus, dial-in, bibliographic access to the collections is available. The library also houses the celebrated Marian Library, rare books, other special collections, and the University Archives.

The **Marian Library** on the seventh floor of the Roesch Library, is the world's largest collection of printed materials on the Virgin Mary. Its resources, in over fifty languages, include over 70,000 books and pamphlets - some 4,000 printed before 1800 - runs of 125 periodicals, a clipping file of nearly 51,000 items, microfilm, a philatelic collection, and noteworthy accumulations of slides, medals, postcards, photographs, and other pictorial materials. Supplementing these is a general reference library comprised of national and regional bibliographies, works on the Bible, church history, religious art (especially Eastern Church art and art of medieval Europe) and the history of the book. The Marian library publishes the scholarly annual *Marian Library Studies*. As the International Marian Research Institute, it offers graduate-level courses in Marian Studies.



*Library Lawn*

## **SCHOOL OF LAW LIBRARY**

The library of the School of Law is located on the ground floor of the Roesch Library. Its collection exceeds 165,000 volumes.

## **SOUTHWESTERN OHIO COUNCIL FOR HIGHER EDUCATION**

The University's active membership in this council significantly augments the library resources available to its students. Some libraries in the council will lend materials directly to students from other schools; others require interlibrary loan forms, which may be secured from one of the reference librarians.

Other libraries in the area available to graduate students include the Dayton public library system; the libraries of the Engineers' Club, local hospitals, certain units of Wright-Patterson Air Force Base, and certain area businesses.

A special delivery van makes stops at many of the SOCHE libraries in the Dayton area to deliver books, films, photocopy and other materials on a daily basis.

## **COMPUTERIZED ONLINE LITERATURE SEARCHING**

Through a computer terminal in the Reference Department, the Roesch Library has access to over two hundred databases containing bibliographic information for every area of study at the university: arts, business, education, engineering, law, and sciences.

Reference librarians can search these databases for a student to produce a bibliography tailored to a research project. The student is present during the computer search and can judge the results as they are printed on the terminal.

## **SCHOOL OF EDUCATION COMPUTER IN EDUCATION CENTER**

The School of Education Computer in Education center is located in Chaminade Hall. SECEC houses 20 microcomputers (five Apples and 15 DecisionMates). There is adjacent classroom space, a work area, and storage room. The Center provides instruction for graduates and undergraduate students in the School of Education.

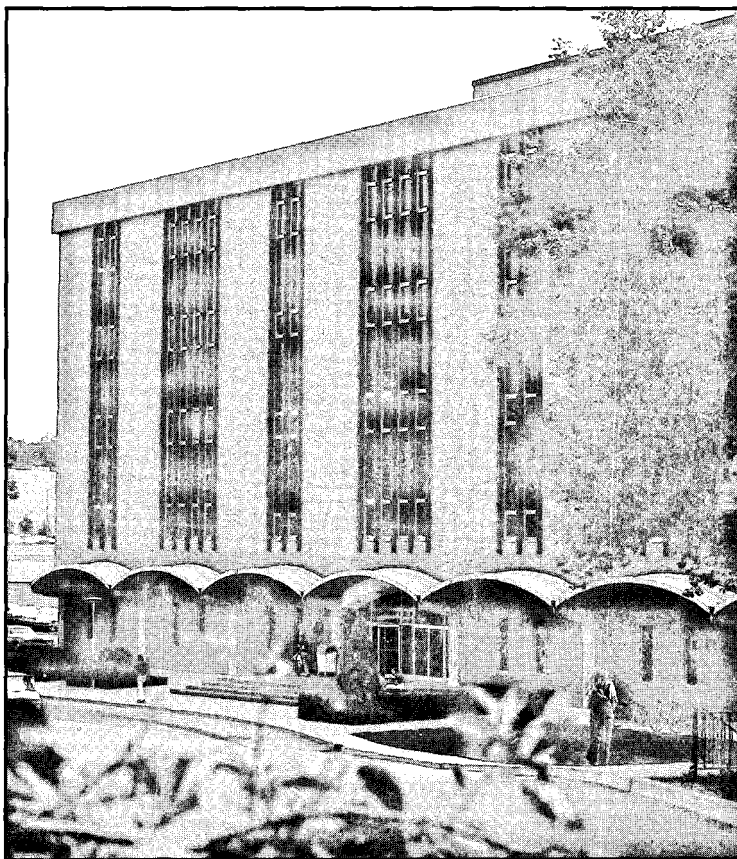
## **THE SCHOOL OF EDUCATION CURRICULUM MATERIALS CENTER**

The Louis J. Faerber, S.M. Curriculum Materials Center houses the specialized collections of the School of Education and is located in Chaminade Hall. Its collection offers elementary and secondary school teaching materials, filmstrips, recordings, transparencies, cassettes, charts, material kits, and other teaching aids and resources for graduate students. The center also houses Master's projects completed in the School of Education.

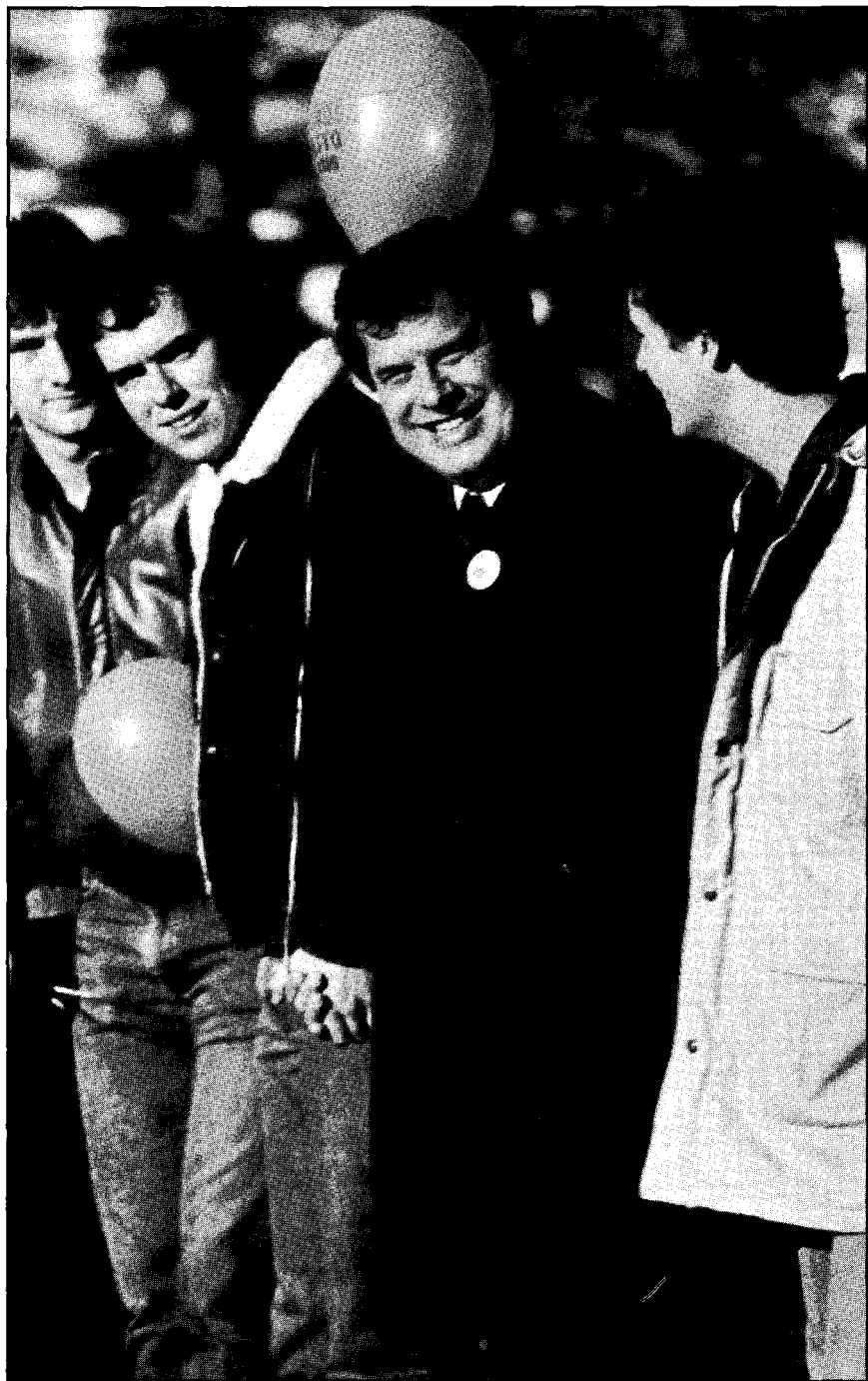
## RESEARCH INSTITUTE

As an integral unit of the University, the Research Institute administers sponsored research that the University agrees to perform for commercial and government agencies. Research projects are in such diverse areas as ecological studies, bone implants, blood flow, heart and muscle investigation, aerodynamics and structural mechanics, archaeological investigations, systems analysis, and the development of high strength magnetic materials.

Projects concerning a single discipline are conducted by the appropriate academic department, and multidisciplinary projects are normally conducted in research facilities under the direct jurisdiction of the Research Institute. There is strong emphasis on the integration of all research with the instructional activities of the University, and a concerted effort is made to provide opportunities for graduate students to acquire training and experience in research.



*Eugene W. Kettering Engineering & Research Laboratories*



President Raymond Fitz, S.M. and Students

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## IV STUDENT LIFE AND SERVICES

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The Vice President for Student Development and the Dean of Students and staff are responsible for assisting in developing and maintaining an environment which will support the educational goals and the Christian values of the University of Dayton. While students are encouraged to make decisions, it is understood that decision-making involves risks. The Student Development staff provides individual and group counseling and supportive reinforcement, treating all students as individuals. All members of the Student Development staff are professional counselors.

### HOUSING

The University of Dayton does not maintain on-campus housing for graduate students. Suitable rooms, apartments and other accommodations are available in the immediate vicinity within easy commuting distance. *There is a limited number of graduate spaces for Law School students only. Law School students interested in University owned houses should contact the Housing Office upon their acceptance.*

Students new to the Dayton area are cautioned to arrange for housing prior to the beginning of a semester. Many choice accommodations are taken by the time classes start.

### FOOD SERVICE

Food Service operates three full service dining facilities, located on the ground floors of Kennedy Union, Marycrest Complex, and the new residence facility. Snack bars are open evenings and weekends and are located in the Marycrest dining area, Stuart Hall and Kennedy Union. The Kennedy Union facility features a student pub and specialty food shops, that offer pizza, deli items, pastries, ice cream, and beverages throughout the day and evening.

Food Service uses a computerized dining system. Graduate students may eat in any facility using a meal contract card. A variety of economical meal contracts are available through the Meal Ticket Coordinator, 2441, but graduate students may eat on a cash basis if they wish.



## **CAMPUS SECURITY AND PARKING**

Campus Security is the recognized, lawful, professional police agency on all University property. It is the objective of this department to make the University a comfortable, efficient, and safe place. University of Dayton Campus Security is dedicated to the preservation of freedom of movement and communication with a minimum of fear of property or personal injury.

A one-year parking permit may be obtained for a fee at the Traffic Office, Gosiger Center. This is a color-coded decal indicating the lot to which the permit holder has been assigned. Parking facilities on the main campus are limited. Restrictions to assigned lots are enforced rigidly between 6 a.m. and 5 p.m. on weekdays. After 5 p.m. daily and on weekends, all University lots (except for restricted zones) are open to all permit holders. An evening student may obtain an evening permit for the same fee. Note, however, that evening students arriving on campus before 5 p.m. on weekdays may park only in Lot A.

The Traffic Office brochure, issued with the permit, lists traffic regulations in detail. Drivers are expected to know these and observe them. The emergency telephone number on campus is 2121.

## **STUDENT IDENTIFICATION CARDS**

All registered students must have validated student identification (ID) cards. This card, validated for the given term, is needed to withdraw books from the Roesch Library and to obtain numerous other University services. ID's are issued and validated by the office of the Registrar.

## **OFFICE OF UNIVERSITY ACTIVITIES**

The Office of University Activities sponsors and coordinates extra-curricular and co-curricular activities for University organizations, departments, groups, and students in general. These not only enrich and enhance educational, cultural, and social development but foster a spirit of community in accord with the objectives of the University of Dayton.

Numerous and varied cultural, educational, social, and recreational activities take place on campus, many of them in the Kennedy Memorial Union. Among the continuing programs are the University Arts Series, with renowned guests, chiefly in music, theatre, dance, and literature; the Distinguished Speakers Series; the Music Division series of recitals and concerts by students and faculty; regular productions by the Performing & Visual Arts department and the Theatre Division; and contemporary films and art exhibits in the Kennedy Union Art Gallery, Roesch Library, Rike Center, and O'Reilly Hall.

## **RECREATIONAL SPORTS**

The Recreational Sports Department conducts activities of interest to the men and women of the University of Dayton. The aim is to provide individuals opportunities to participate in some activity of their own choosing, insofar as facilities and equipment permit. Intramural activities are organized on a team and individual basis, thereby enabling all to participate.

The Recreational Sports office, located in Room 211 of the PAC building, is the administration center for men's, women's, and coed Intramural Programs. Any suggestions or questions about the Intramural Program should be directed to the director of recreational sports at 229-2731.

**GRADUATE STUDENTS.** A graduate student membership costs \$25 individual and \$35 for a family membership for a full year starting August 15.

Facilities which are available to graduate students include Physical Activities Center and Fieldhouse. They house the following.

### **PAC**

- |                                  |                               |
|----------------------------------|-------------------------------|
| I. Collins Gymnasium             | III. Weight Room              |
| a. Four basketball/tennis courts | a. Six Universal Gym Machines |
| b. 1/10 mile jogging track       | IV. Multi-Use Room            |
| II. Lackner Natatorium           | a. Two table tennis tables    |
| a. Eight lane - 25 yd.           | b. One set of exercise mats   |
| Indoor heated pool               | V. Racket Courts              |
| Two - 1 meter diving boards      | a. Three handball/            |
| One - 3 meter diving board       | racquetball courts            |
| b. 2500 sq. ft. Sun Deck         | b. One squash court           |

### **Fieldhouse**

- I. Main Gymnasium
  - a. Four basketball/volleyball courts
  - b. Three badminton courts
  - c. Seating for 3,500
- II. Weight Room
  - a. Nautilus Equipment
  - b. 2000 lbs. Olympic weights

## **HEALTH SERVICES**

Medical care is available at the Gosiger Memorial Health Center to all full-time and part-time graduate students. Basic medical care and most nonprescription medicines are provided without charge. The Health Center is open from 8 a.m. to 7 p.m. on weekdays and from 8 a.m. to 3 p.m. on Saturdays. In case of emergency, call Campus Security, 2121. A physician is available for consultation every weekday morning and afternoon. On Wednesday afternoons graduate students (and Marianists) are given priority in the doctor's clinic.

Pre-admission physical examinations are no longer required, but students with chronic health problems are advised to have their physicians send records or recommendations to the medical director. Full-time graduate students are eligible for student health and accident insurance. For information about this program visit Room 111 at the Gosiger Health Center.

## **HUMAN RELATIONS OFFICE**

The Human Relations Office located in St. Mary's Hall, Room 122, provides services in three distinct areas to students, faculty, and administrative staff. These areas are Affirmative Action/Equal Employment Opportunity (AA/EEO) Compliance, Community relations, and facilitating inter-group communication within the University. Its director is the University's compliance officer for Affirmative Action/Equal Employment Opportunity (AA/EEO) and Title IX of the Education Amendment of 1972, Sec. 503 and 504 of the Rehabilitation Act of 1973, Sec. 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974, and the Age Discrimination Act of 1975.

The Office serves as a primary conduit for two-way communications between the University and the Dayton black community.

## **INTERNATIONAL EDUCATION SERVICES**

The University of Dayton maintains two offices to serve the needs of international students and others whose native languages are not English. These services are available to any member of the University community for whom English is not the primary language.

### **INTERNATIONAL STUDENT ADVISOR**

The international student advisor provides individual counseling on immigration, financial, and social needs, offering assistance in such matters as housing, meal tickets, and campus jobs. The advisor is always available in emergencies. Arrangements to see the international student advisor should be made within twenty-four hours of a new student's arrival on campus.

### **INTERNATIONAL SERVICES**

The coordinator, International Services, assists international students in all matters pertaining to admissions, including the evaluation of foreign credentials to determine the amount of credit transferable to the University of Dayton. The coordinator is also available to advise and assist members of the faculty and others of the campus community in matters pertaining to visas and immigration law.

## **THE COUNSELING CENTER**

In keeping with the University's dedication to educating the whole person, the Psychological Services Center is designed to assist students in self-development. Graduate or Law students may find a time when they need an "objective third party" with whom to express their feelings and thoughts about personal situations. Difficulties with decision-making, interpersonal relationships, loneliness, family-marital issues, career choice and insomnia, are some concerns that post-graduate students may encounter. The Center provides an atmosphere in which these, or any other issues, can be discussed freely and openly. Students decide to what extent they want to divulge

personal information. Strict professional confidentiality is maintained at all times. No information regarding conversations leaves the Center without the students' permission.

All undergraduate students pay an initial student fee to cover the cost of these services. Graduate and Law students are not initially charged a fee for these services. If a choice is made to make use of the Center and its facilities, there are two possible fee structures. The first option is to pay \$10 per session.

If the need arises to use the Center throughout the time spent at the University of Dayton, then paying a \$70 fee would cover all visits. No graduate or Law student would ever pay more than \$70 for these services. All students are encouraged to use the Center and not allow the fear of being charged a fee to be a stumbling block for seeking assistance. Special arrangements can be made.

Appointments can be made in person or by phone. Making an appointment is customary. If an emergency arises, however, no appointment is necessary and students will be seen as soon as possible.

## **GRADUATE AND ALUMNI PLACEMENT**

The services of the Placement Office, Jesse Phillips Center, which are available to seniors, graduate students, and alumni seeking positions in business, industry, and government, include the following:

1. Personal enjoyment counseling.
2. A library of literature describing opportunities with more than 400 employers.
3. A listing of current job openings.
4. Direct referral to employers.
5. Campus interviews by representatives of business, industry, and government (conducted from October through March; announced in a monthly calendar which can be obtained in the Placement Office).

Part-time and summer employment are the responsibility of the Student Employment Coordinator, Office of Personnel Services. Teacher placement is the responsibility of the Teacher Placement Office, School of Education.

Information about graduate assistantships may be obtained from the appropriate departmental chairperson or program director.

## **PRIVACY RIGHTS OF PARENTS AND STUDENTS**

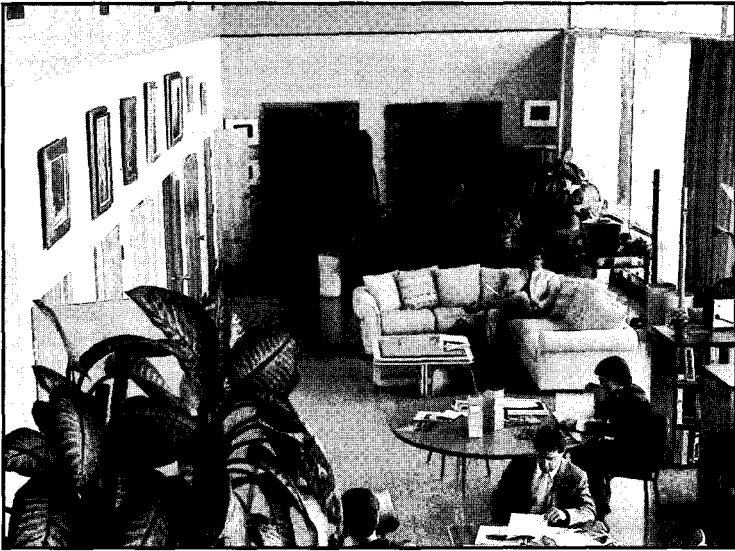
In compliance with Section 438 of the General Education Provisions Act the University of Dayton has published regulations designed to protect the privacy of parents and students as to the access and to the release of records maintained by the institution (see University of Dayton Student Handbook).

## **THE STUDENT HANDBOOK**

Each student at the University of Dayton is responsible for knowing and observing the policies, regulations, and procedures contained in the official student handbook. This publication provides much other useful informa-

tion on such subjects as University services, student publications, and intercollegiate and intramural sports schedules.

Student handbooks are available at the opening of the Fall term in the Information Center, and the Off-Campus Center for Community Relations.



*Interior of Jesse Philips Center*

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## V GENERAL ACADEMIC INFORMATION

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The academic requirements and regulations described in this chapter are those of the University which, unless otherwise noted, take precedence over all others and apply to all graduate students. The student is expected to assume full responsibility for knowing and following all pertinent regulations and procedures of the graduate school as set forth in this *Bulletin* and for meeting the standards and requirements expressed herein.

The admission of candidates, their continuance and status, the awarding of academic credits, and the granting of degrees are all subject to the ordinary regulatory powers of the University. The University reserves the right to withhold or cancel, at its discretion, any of these privileges for reasons considered sufficient by its own governing body.

The University of Dayton presently awards the following degrees beyond the Baccalaureate:

- Master of Arts
- Master of Business Administration
- Master of Clinical Chemistry
- Master of Clinical Laboratory Technology
- Master of Computer Science
- Master of Public Administration
- Master of Science
- Master of Science in Aerospace Engineering
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Education
- Master of Science in Electrical Engineering
- Master of Science in Electro-Optics
- Master of Science in Engineering
- Master of Science in Engineering Management
- Master of Science in Management Science
- Master of Science in Materials Engineering
- Master of Science in Mechanical Engineering
- Master of Science in Teaching
- Educational Specialist Degree in Educational Leadership
- Juris Doctor
- Doctor of Engineering
- Doctor of Philosophy in Biology
- Doctor of Philosophy in Engineering
- Doctor of Sacred Theology

## ADMISSION

Men and women graduates of approved colleges or universities who hold the Bachelor's degree are eligible for admission. Applicants must have had adequate undergraduate preparation in their proposed fields of study and must show promise for pursuing higher studies satisfactorily.

Inquiries concerning admission and requests for application forms should be addressed to the Office for Graduate Studies or to the office of the dean of the appropriate School or College. The application for admission to graduate work should be submitted by August 1 for the first term, by December 1 for the second term, by April 1 for the third term, and by June 1 for the second half of the split third term. It is the responsibility of the student that the application, with all necessary supporting documents, be complete and in order. Registration as a graduate student will not be permitted otherwise.

Upon admission, students are designated as full time or part time by their deans or program directors. The determination of such status for graduate assistants, students engaged in research, and, in general, all graduate students is made by their respective chairpersons.

Graduate students are also classified according to their relationship to formal programs, as follows:

1. **Regular status** — the student who has met satisfactorily all the general requirements of the College or School and the specific requirements of the department in which the program is given.
2. **Conditional status** — the student who must fulfill some prerequisite imposed by the School or department before admission to regular status; and the student whose preparation cannot yet be determined.
3. **Unclassified status** — the student belonging to either of the categories below. The unclassified student will be considered as the student of a School or the College but will not be officially enrolled in a graduate program leading toward a degree.
  - A. **Non-degree or special** — a student who fulfills all the requirements and is taking courses for credit but is not seeking a degree.
  - B. **Transient** — a properly qualified student working toward a degree in another institution who has written authorization from the dean of that institution to take specific courses at the University of Dayton for transfer of credit. The transient student must satisfy all registration requirements of the given course that are mandatory for students working for a degree at the University of Dayton.

## APPLICATION

The APPLICATION FORM must be completed by typewriter or printed in black ink. When completed, it should be returned to the Office for Graduate Studies.

**OFFICIAL TRANSCRIPTS** must be submitted directly from the Registrars of all previously attended colleges or universities to the Office for Graduate Studies. Registration will be permitted only when the final transcript (showing the university seal and highest degree attained) is on file.

**LETTERS OF REFERENCE** should be completed by professional persons able to judge the applicant's academic qualifications for your proposed field of study and returned to the Office for Graduate Studies.

**THE UNIVERSITY OF DAYTON** operates under an early semester, split third-term calendar. The First Term begins in late August; the Second Term in early January; the Third Term, first session, in May; and the Third Term, second session, in June. (Consult the current Graduate Announcement for exact dates.)

**IT IS THE APPLICANT'S RESPONSIBILITY** to see that all required documents are on file at least one month prior to the beginning of the term for which admission is sought.

### **ADMISSION TESTS**

GMAT ..... required by the SCHOOL OF BUSINESS

GRE required by the following departments: BIOLOGY, CLINICAL  
LABORATORY TECHNOLOGY, COMMUNICATION,  
PSYCHOLOGY

MAT ... suggested for the CLINICAL PSYCHOLOGY program

**ALL APPLICANTS FOR GRADUATE ASSISTANTSHIPS** should include a statement, not to exceed a thousand words, describing academic preparation, vocational objectives, and particular interests in their field of study. Applications are due by March 1 and should be submitted directly to the department.

**INTERNATIONAL STUDENTS** applying for graduate study must complete a different application form. Contact the International Services Office for further information.

An application fee of \$20.00 must accompany this form before your application can be processed. Make checks payable to the University of Dayton. This fee is not refundable.

## **INTERNATIONAL STUDENT ADMISSION**

Students from foreign countries should request information and applications from the Office of International Services. A student from a foreign country seeking admission to any graduate program must have completed a minimum of sixteen years of schooling, must have earned a Bachelor's degree or its equivalent, and must present evidence of outstanding success in the chosen field of study. An applicant who is a citizen of a foreign country will be required to supply the following information along with the formal application form:



1. A complete academic record, including secondary school.
2. Three recommendation letters.
3. Scores from the Test of English as a Foreign Language (TOEFL).
4. Scores from the Graduate Record Examination (GRE). *Exception:* instead, M.B.A. candidates must furnish scores from the Graduate Management Admissions Test (GMAT).
5. A personal *vita*, including work experience, research study or experience, and professional development objectives.
6. Evidence of sufficient funds to cover tuition, room and board, and return transportation costs; and, from countries where applicable, evidence of exchange funds and export permission. A Master's degree requires approximately two calendar years for completion.

International students should complete the application procedure two months prior to the beginning of classes for any term (see academic calendars). Initial inquiries should be made at least one year before the term in which the student seeks admission.

**NOTE:** *There are no exceptions for international students to the above rules. For specific directions, see the Guide to Admissions for International Students.*

## **VETERANS**

All departments at the University have been approved by the State Approving Agency for Veterans' Training. The Veterans Affairs Office is located in St. Mary's 202 and will assist in processing the necessary forms for educational benefits. Each semester the Veterans Schedule Form must be submitted and any changes in program reported in writing. Failure to follow this procedure may result in cancellation of benefits by the V.A.

## **UNDERGRADUATE STUDENTS IN GRADUATE COURSES**

An undergraduate student may register for graduate courses only under the following conditions:

1. Graduate courses to count toward the undergraduate degree:
  - a. Approval must be obtained from the director of the appropriate graduate program.
  - b. The student's total course load must not exceed 17 semester hours during that term.
2. Graduate courses to count toward the graduate degree:
  - a. Approval must be obtained from the director of the appropriate graduate program.
  - b. The student's total course load must not exceed 17 semester hours during that term.
  - c. The student must be within 15 semester hours of completing the semester-hour requirements for graduation in the undergraduate program.

- d. Credit obtained for the graduate courses may not be counted toward both the Bachelor's degree and for any future Master's degree.
- e. The undergraduate student whose status is less than full time or  $\frac{3}{4}$  time must pay the graduate tuition rates to register in graduate courses for graduate credit.

## **ADVISING**

Initial academic advising is usually done by the program director or a temporary advisor. Following this the graduate student may be assigned to a permanent advisor or a graduate committee. In either case all details of the program will be decided by the student and advisor.

## **REGISTRATION FOR COURSES**

The responsibility for being properly registered rests with the student. Registration is required each term or session of all students who enter course work for credit and of all students who wish to audit courses. The written approval of the proper dean or the designated director or advisor is required for admission to any course. Any student who has interrupted the normal sequence of a graduate program is required to apply to the designated advisor or program chairperson for permission to resume study, at least four weeks prior to the first day of the term.

All students should consult the Graduate Composite for each term well in advance of registration in order to determine the scheduling of courses. Students enrolling at the off-campus centers should note that although the scheduling of off-campus classes follows the general pattern of the University calendar, they do not necessarily conform to the on-campus academic dates in all details. Students in the School of Law should note a separate Law School calendar in Chapter XI, and those in the School of Education should consult the School of Education section in this Bulletin.

## **MASTER'S AND DOCTOR'S DEGREE REQUIREMENTS**

The College of Arts and Sciences and the Schools of Business Administration, Education, Engineering, and Law offer programs variously distributed in time, leading to the Master's and Doctor's degrees. Specific requirements and sequences leading to these degrees are described in Chapters VI through XI, as are the specific curricula, courses, and requirements of the Schools and departments offering them.

### **Residence Requirement**

For the Master's degree, at least 24 semester hours of credit, or its equivalent, must be earned at the University of Dayton or its off-campus centers.

For the Doctor's degree, two-thirds of the semester hours required beyond the Master's degree should be earned at the University of Dayton. Generally, this is 48 semester hours beyond the Master's degree. For the Doctor's degree, a student must be a full-time student for at least two semesters or the equivalency.

## **Transfer Credits**

A maximum of two courses of graduate work may be allowed in transfer from other accredited institutions to the University of Dayton provided the work is of B grade or better. The quality points are not transferred. Usually no transfer credit will be allowed for courses taken more than five years previous to matriculation in the graduate schools of the University of Dayton.

During the initial years of operation of any new program, exceptions to this limitation may be made with the approval of the Dean for Graduate Studies.

## **Advanced Undergraduate Courses**

Some programs permit certain 400-level undergraduate courses to be applied to graduate program credit requirements. When such courses are permitted for graduate-level credit, then the work done shall be of the grade of B or higher in order for that credit to be accepted toward a degree. The student must pay the graduate tuition rates when registering in these courses for graduate credit.

## **Elective Courses**

Most graduate programs allow, and encourage, the student to select one or two courses from other related disciplines. Consult the advisor or program director for details.

## **Foreign Language Requirement**

At the discretion of the department offering a particular program, a reading knowledge of a foreign language may be required for the master's degree. Graduate students can take language courses on class or tutorial basis by special arrangement through the Department of Languages, College of Arts and Sciences. No graduate credit is allowed for the fulfillment of language requirements.

## **Comprehensive Examination**

A comprehensive examination is required in most programs. This examination may be oral or written, or both. Application for any comprehensive examination must be approved by the chairperson of the student's major department at least two weeks prior to the examination. For further details, consult the explanation under the appropriate individual program in this Bulletin.

## **Thesis and Other Requirements**

Students in a program requiring a thesis, an equivalent project, a candidacy examination, or a dissertation may begin work only with the approval of the program director or of an advisor delegated with the authority to give it. Both the form and the content of the final work must have the approval of at least three members of the department, including the faculty advisor and the chairperson or director.

*The Manual for the Preparation of Graduate Thesis and Dissertations* is available

from the Office for Graduate Studies, 200 St. Mary's Hall.

At least three final copies of a master's thesis in approved form must be submitted at least two weeks before the date of graduation. Students in doctoral programs should consult appropriate sections of this *Bulletin* for requirements concerning candidacy and such matters as the number of copies of the dissertation, as well as for regulations governing topics, approval, and procedures.

## Sufficient Progress

Students are expected to maintain sufficient progress towards a degree. At various intervals, usually at each registration period, and especially at mid-point in the program, the advisor or program director will discuss rate of progress with the student. Students not showing promise of completing the program in a reasonable time may be advised to withdraw from the University.

## Appeal For Change of Grade

Any appeal for change of grade for a particular course should be directed to the dean of the School in which that course is offered.

## Time Limit

All requirements for a master's degree must be satisfied within *seven* calendar years from the time of matriculation.

All requirements for a doctoral degree must be satisfied within *five* calendar years after admission to candidacy.

## Second Master's Degree

In some cases a student, either possessing a master's degree or currently studying toward one, wishes to obtain an additional master's degree in a related field. Only six semester hours from the first program may be applied toward the requirements of the additional degree.

## Academic Standards

To be in good standing, a graduate student must have a 3.0 quality point average at all times. Grades are expressed on the student's permanent record in the following manner:

- A — *Excellent*: 4 quality points are assigned for each semester or quarter hour.
- B — *Average*: 3 quality points are assigned for each semester or quarter hour.
- C — *Poor*: 2 quality points are assigned for each semester or quarter hour.
- F — *Failed*: 0 quality points are assigned.
- CR — *Passed*: Credit is given, but no corresponding quality points are given. This is used by certain departments when the thesis or special courses are not to affect the 3.0 cumulative quality point average needed to be in good standing.
- I — *Incomplete*: To be used when a course has terminated but the student, for an acceptable reason, has not completed the work of the course.

*The I has 0 quality points per hour and does not affect the cumulative point average. It can be changed to a letter grade if the student has completed the work. Otherwise it will remain on the permanent record indefinitely.*

- K — Credit:** This mark is used only for credits accepted as transfer credit from other institutions. No quality points are allowed.
- P — In Progress:** For the thesis or for courses which have not terminated at the end of semester. After the course or thesis is completed, the P is replaced on the permanent record by an A, B, C, F, or with the corresponding credit and quality point average.
- W — Withdrawal:** Any withdrawal or change of course must be processed by an official Drop-Add Form through the Registration center, with the approval of the graduate student's advisor. During the first three weeks of a full term (or 10 calendar days of a split term) a graduate student may withdraw from a class without record. Financial adjustments, if allowed, will be made only from the date of notification of withdrawal.
- X — Audit:** This mark indicates that the graduate student has registered to audit the course. No credit hours or quality points are awarded for this mark. **NOTE:** *Any course taken for audit may not be retaken for credit.*
- Em — Examination:** This mark indicates credit given to students (registered in the University) on the basis of examinations after admission to the University. The level of achievement to be demonstrated by the student on these examinations is determined by the department in which the course is taught. Such credit shall be assigned only on authorization of the dean of the School or College in which the student is registered. No quality points are allowed.

The various deans will review at intervals the work of their graduate students, and in consultation with the program directors and/or chairpersons of the departments, will recommend that those who are not doing work of a high caliber be advised to discontinue courses leading to a degree.

The disciplinary authority of the University is vested in the president by right, and in the deans and other officers on whom jurisdiction may be conferred for specific cases and in restricted areas.

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## **VI INTERDISCIPLINARY AND JOINT STUDIES**

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George B. Noland, Associate Provost, Dean for Graduate Studies and Research, and Director of the Research Institute.

Kitayun E. Marre, Assistant Dean for Graduate Studies

### **INDIVIDUAL INTERDISCIPLINARY PROGRAM**

The University of Dayton, under the direction of the Associate Provost, offers individual interdisciplinary programs designed by the student in cooperation with an advisor and representatives from the selected programs. Applicants must have a Bachelor's degree with a general cumulative point average of 2.8 or above, and are expected to submit a formal written request for an individually-designed interdisciplinary program to the graduate council.

The interdisciplinary program does not take the place of an established graduate program. Rather, it is a specific program drawn up from several disciplines to meet a special need, frequently for job-related requirements. It must produce interrelated applications of specific disciplines and skills at the graduate level. For instance, a clinical dietitian employed in a hospital may seek graduate level expertise in counseling and education for patients with chemical dependencies and for teaching interns. Such a student finds that a Master of Science in the interdisciplinary program serves the special needs for a broader knowledge base encompassing physiology, communication, and counseling. Under the direction of an advisor and a committee of professors from the required areas, a proposed course of study can be defined for this student, submitted to the graduate council, and after approval, carried out under the advisor's supervision. Or, to take an instance in the humanities, a student may seek graduate level expertise in historical preservation. Such a student seeks more general learning and professional expertise, and finds that a Master of Arts in the interdisciplinary program serves special needs in history, art, and public administration. Again, under the direction of an advisor and a committee of professors from the required areas, a special course of study can be defined for the student, submitted to the graduate council, and after approval, carried out under the advisor's supervision.

The degree will be either a Master of Arts or a Master of Science. The Program should involve several disciplines and be directed by one faculty member from each discipline. The three faculty members constitute the advisory committee. The final program will be drawn up and approved by the advisory committee. Copies will be sent to the chairpersons of the department involved.

Of a minimum of 30 semester credit hours required, 15 may be divided between directed study and a thesis, but must be related to the interdisciplinary areas; and 6 semester credit hours of electives in more distantly related areas may also be chosen.

The formal request for an individual interdisciplinary program must include:

1. A general description of the proposed course of study and the reasons for choosing such an interdisciplinary program, rather than one offered in a single department.
2. The courses (at least 15 semester hours) which will be taken and the department involved in the overall work.
3. If a project or thesis is desired: a clear statement of the specific nature of the topic, the research intended, and the purpose of the project or thesis.

## **OTHER INTERDISCIPLINARY PROGRAMS**

### **AMERICAN STUDIES (AMS)**

Francis J. Henniger, Director of the Program

The College of Arts and Sciences, under the guidance of the program director and an advisory committee composed of the representatives of several supporting disciplines, offers the Masters of Arts in American Studies. The supporting disciplines are: Economics, English, Teacher Education, History, Philosophy, Political Science, Psychology, and Religious Studies. See Chapter VII for details of the program.

### **CLINICAL LABORATORY TECHNOLOGY (CLT)**

Charles J. Chantell, Director of the Program

The Master of Clinical Laboratory Technology program educates practicing clinical laboratory scientists (MT, CT, NMT) who wish to work in health science administration or health science education. The CLT is an interdisciplinary program that uses clinical faculty and cooperating faculty members in the Schools of Education, Business Administration, and the College of Arts and Sciences.

Direct application of the material gained in course work is insured during a personalized practicum under the direction of clinical faculty. See Chapter VII for details of the program.

## **COMMUNICATION (CAI) INTERDISCIPLINARY PROGRAM**

Donald B. Morlan, Director of the Program

The Communication interdisciplinary study program leads to the Master of Arts. It requires 24 semester hours of study in Communication, 12 semester hours of study in one of several designated interdisciplinary areas, followed by oral comprehensive examinations on both the course work and the thesis. See Chapter VII.

## **INTERNATIONAL MARIAN RESEARCH INSTITUTE (IMI)**

Matthew F. Kohmescher, S. M., Director of the Program

Through the Marian Library, the University of Dayton administers a program of studies in Theology, centered on the Virgin Mary in the context of modern Christology and Ecclesiology. On campus the Institute offers graduate-level summer courses of two to six weeks in length. One who completes the required courses receives a Certificate in Marian Studies from the Institute itself. Any credits earned are valid as Continuing Education Units (CEUs). Such credits may likewise be applied toward an M.A. in Religious Studies from the University of Dayton's Department of Religious Studies. The Institute's classes are also open to qualified auditors. A special program prepares candidates for the Pontifical degrees: S.T.L. and S.T.D. with specialization in Marian theology. These latter degrees are conferred in the name of the Marianum, a pontifical theological faculty in Rome. The Baccalaureate in Theology or its equivalent is a prerequisite for the S.T.L. Dissertations for the Pontifical degrees are written and defended under the direction of the Institute's professors.

## **TEACHER EDUCATION (EDT) INTERDISCIPLINARY PROGRAM**

Thomas J. Lasley, Chairperson

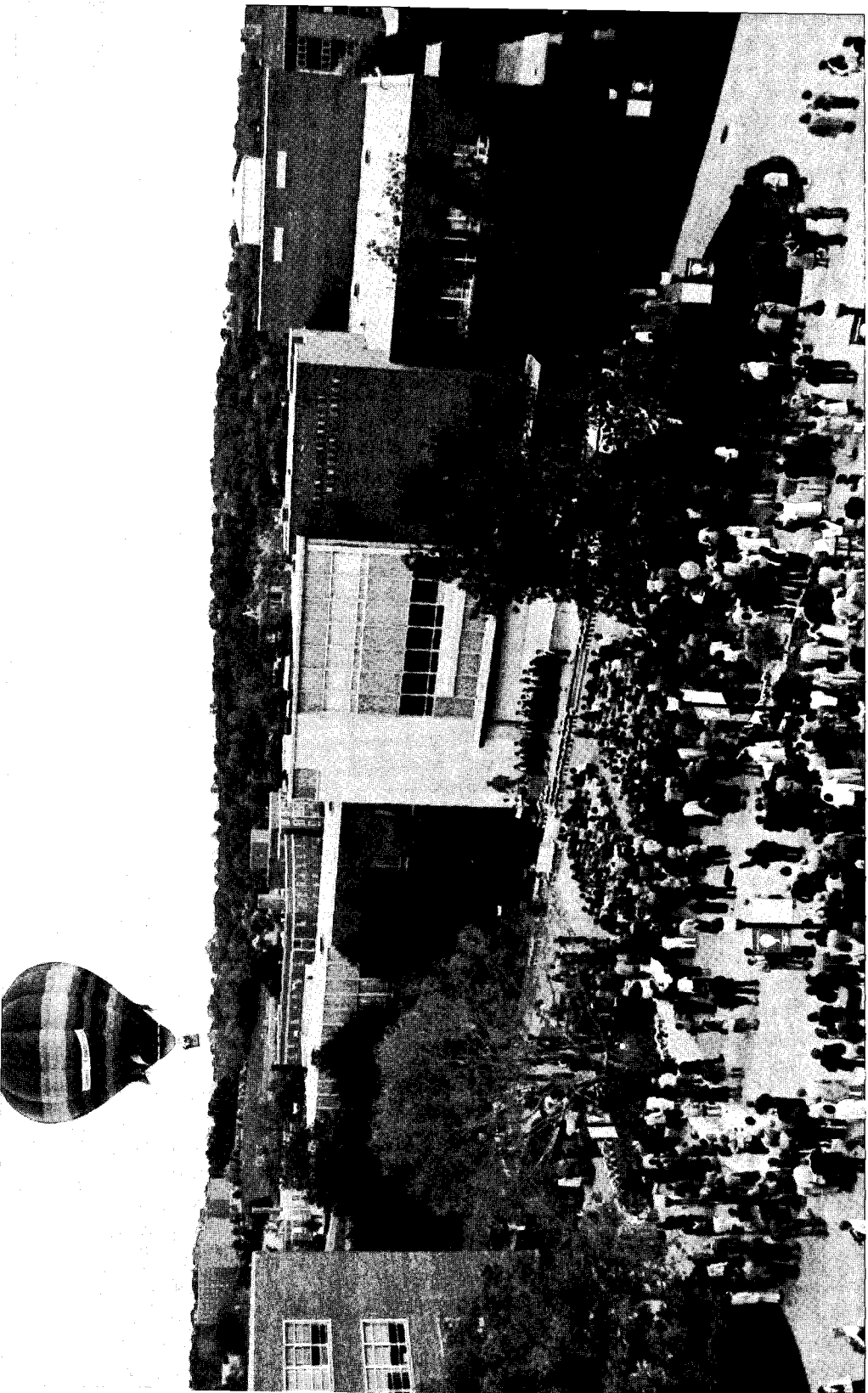
James E. Gay, Assistant Chairperson

The Department of Teacher Education in the School of Education offers a program which enables students to develop an individually designed program in a specific area in Education. Students have developed concentrations in such areas as gifted education, adult education, and values education. With the assistance of the faculty, students develop a plan through a selection of offerings in Teacher Education and other departments. See Chapter IX and consult with assistant chairperson or chairperson.

## **ELECTRO-OPTICS (EOP)**

The program of study for the Master of Science in Electro-Optics is an interdisciplinary program administered by the School of Engineering with the cooperative support of the College of Arts and Sciences. See Chapter X.





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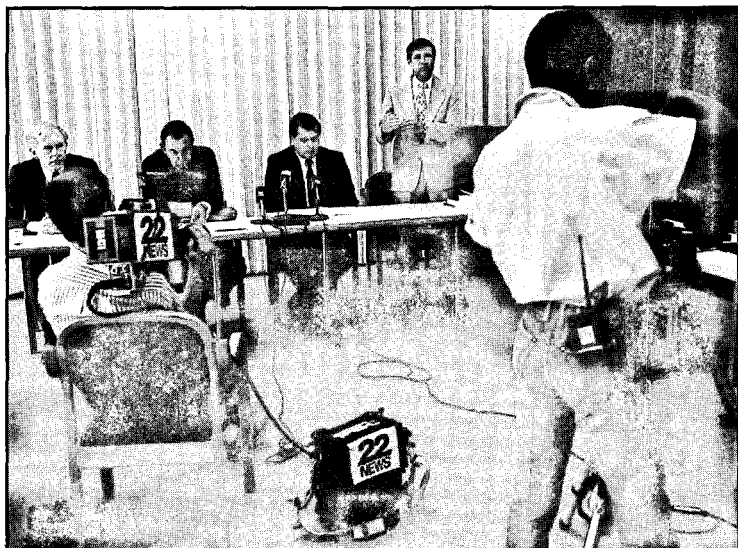
## VII COLLEGE OF ARTS AND SCIENCES

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Francis M. Lazarus, Dean

The objectives of graduate work in the College of Arts and Sciences coincide with the general aims and philosophy of education that characterize the University of Dayton.

Programs leading to the Master of Arts or the Master of Science are offered in American Studies, Biology, Communication, English, History, Mathematics, Applied Mathematical Systems, Pastoral Ministries, Philosophy, Physics, Political Science, Psychology, and Theological Studies. The Department of Computer Science offers the Master of Computer Science. The Master of Public Administration is also offered through the Department of Political Science. An interdisciplinary Master of Clinical Laboratory Technology degree is offered in cooperation with the Schools of Education and Business Administration. The Doctor of Philosophy degree is offered by the Department of Biology.



*University of Dayton/Sinclair College Press Conference*

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## **AMERICAN STUDIES (AMS)**

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Francis J. Henninger, Director of the Program

The American Studies program requires that students take courses in several disciplines in order to study the American experience. The Program trains the student to research data in the required disciplines for select information, and to integrate that information toward a broader understanding of the American experience.

Because American Studies is interdisciplinary in its direction its advisory committee is composed of members from several departments: Economics, Lawrence Hadley; English, Peter Arons; Teacher Education, Joseph Watras; History, Roberta Alexander; Philosophy, Joseph Kunkel; Political Science, David Ahern; Psychology, Charles Kimble; and Religious Studies, William Roberts.

### **ADMISSION REQUIREMENTS**

An applicant must have achieved a bachelor's degree and must have completed at least 72 semester hours in any combination of American Studies, Anthropology, Economics, Education, English, Fine Arts, History, Music, Philosophy, Political Science, Psychology, Sociology, and Religious Studies.

### **PROGRAM REQUIREMENTS**

The program requires 30 semester credit hours. Three semester hours must be taken in American Studies; 27 semester hours may be taken in two to four of the cooperating disciplines, but not less than 6 nor more than 18 semester hours may be taken in any one discipline. 0-6 semester hours of undergraduate courses may be required as prerequisite depending on academic preparation for the program. Courses must be chosen from at least two groups.

When accepted into the program, the student must designate, as accurately as possible, which of the cooperating disciplines will be studied for the degree, and the earliest studies must include courses in at least two of those disciplines. The advisor will determine whether the student shall take AMS 300 or AMS 301 or both. The student shall complete such requirements at the earliest opportunity.

When 12 semester hours toward the Master of Arts have been completed, the student will be examined on his ability to integrate, and make sophisticated comparisons among the disciplines chosen for the degree. The examination is composed and the answers evaluated by a committee of faculty from American Studies and the disciplines in which the student is working.

In the last term the student will take AMS 590, Interdisciplinary Research. In essence this is a master's thesis course. The course is the final step in the student's program: it is a self-designed study of information from at least two disciplines demonstrating a mature ability to produce scholarship from the integration or the comparison of the two.

Courses are chosen from the following groups:

**GROUP A*****English***

- ENG 572 The Romantic Age in American Literature
- ENG 576 Major American Writers
- ENG 580 American Realism and Naturalism
- ENG 584 Studies in Twentieth-Century American Literature
- ENG 591 Studies in Literature<sup>1</sup>
- ENG 605 Studies in an Author<sup>1</sup>
- ENG 609 Studies in a Genre or Mode<sup>1</sup>
- ENG 613 Studies in a Literary Movement<sup>1</sup>
- ENG 621 Studies in the Teaching of Literature<sup>1</sup>

**GROUP B*****Foundations of Education***

- EDT 502 Philosophical Studies in Education
- EDT 510 History of Higher Education in the United States
- EDT 511 History of Education in the United States

***History***

- HST 550 Founding of America
- HST 554 The Age of Jefferson and Jackson
- HST 555 The Old South
- HST 556 Civil War and Reconstruction
- HST 560 U.S. Legal and Constitutional History
- HST 561 U.S. Legal and Constitutional History II
- HST 565 History of American Business
- HST 566 Science, Technology and the Modern Corporation
- HST 570 History of the Cold War
- HST 572 Southern Appalachia
- HST 573 Age of Excess and Reform: U.S., 1877-1920
- HST 575 The Progressive Period, 1900-1920
- HST 576 Between the Wars
- HST 577 Contemporary American History
- HST 660 Studies in U.S. History Before 1877

***Philosophy***

- PHL 621 American Pragmatism
- PHL 625 Philosophy of Language
- PHL 628 Recent Judaic and Christian Philosophy
- PHL 642 Epistemology
- PHL 644 Philosophy of Science
- PHL 651 Philosophy of the Person
- PHL 652 Ethics
- PHL 653 Aesthetics
- PHL 654 Philosophy of Religion
- PHL 655 Social and Political Philosophy
- PHL 656 Philosophy of Law
- PHL 657 Morality, Social Ethics, and Law

***Religious Studies***

- REL 530 Theological Movements
- REL 562 Contemporary Moral Problems
- REL 568 Evolution and Ethics
- REL 571 Theology and Imagination
- REL 575 Theology and Film
- REL 576 Theology and Art
- REL 577 The Religious Quest in Literature
- REL 582 Models of Catechesis
- REL 583 Religious Psychology
- REL 587 Religious Education as Autobiography
- REL 592 Contemporary Issues

<sup>1</sup>Courses which may be counted only when their content is entirely or mostly "American."

**GROUP C*****Economics***

- MBA 500A Graduate Survey in Economics
- MBA 540 Managerial Economics
- MBA 541 Labor Relations and Labor Economics
- MBA 545 National Economic Policy and Forecasting
- MBA 550 Government and Business
- MBA 570 Business and Society

***Foundations of Education***

- EDT 501 Learning Theory and Education
- EDT 504 Human Development and Education
- EDT 509 Politics of Education

***Political Science***

- POL 502 Colloquium in American Politics
- POL 505 The Politics of Bureaucracy and Regulation
- POL 521 Seminar: Intergovernmental Relations
- POL 545 Seminar: Urban Politics and Policy
- POL 546 Seminar: Public Opinion and Political Behavior
- POL 552 Government Planning
- POL 555 Urban and Local Administration
- POL 557 Seminar: State Government and Politics
- POL 571 Seminar: Judicial and Constitutional Politics
- POL 572 Administrative Law
- POL 576 Public Personnel Administration
- POL 579 Seminar: Selected Topics in Public Policy

***Psychology***

- PSY 522 Advance Cognitive Processes
- PSY 524 Human Information Processing
- PSY 525 Basic Processes in Learning and Memory
- PSY 526 History and Systems
- PSY 571 Experimental Child Psychology

PSY 573	Developmental Psychology
PSY 585	Experimental Social Psychology
PSY 586	Applied Social Psychology
PSY 587	Social Influences and Group Dynamics
PSY 588	Interpersonal Processes
PSY 589	Attitudes

### ***American Studies***

AMS 590	Interdisciplinary Research
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## **COURSE OF INSTRUCTION**

AMS 590. INTERDISCIPLINARY RESEARCH: A study of the principles of interdisciplinary scholarship as well as of what can and probably cannot be accomplished by it. Contact with a teacher on a regular basis. The student produces a self-designed study of information from at least two disciplines. 3 sem. hrs.

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## **Department of BIOLOGY (BIO)**

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Kenneth J. McDougall, Chairperson of the Department  
John Rowe, Director of the Program in Biology

The Department of Biology offers programs leading to the Master of Science and the Doctor of Philosophy. Ph.D. applicants without a master's degree will initially be placed in the M.S. program. Students who show outstanding ability may by-pass the M.S. and proceed directly toward the Ph.D.

The degrees are in biology, but each program is tailored to the student's own interests and career plans. Specialization is accomplished by selection of courses, by choice of thesis or dissertation topic, and by participation in weekly seminars in the area of interest. The specific program is determined after consultation between the student and the advisory committee. Primarily to answer the needs of those already in scientific or teaching professions, the Department of Biology also offers a Master of Science program without a thesis requirement. Four major areas of specialization are available. These areas and typical spectra of graduate courses available are as follows:

### ***Animal and General Physiology***

Bioinstrumentation	Endocrinology
Pathophysiology	Immunology
Cell Physiology	Comparative Animal Physiology
Biochemistry	Biometrics
Experimental Embryology	

***Ecology/Field Biology***

Bioinstrumentation  
Population Biology  
Aquatic Biology  
Field Biology

Vertebrate Zoology  
Invertebrate Zoology  
Microbial Ecology  
Biometrics

***Plant and Cell Physiology***

Physiology of Higher Plant  
Advanced Plant Physiology  
Biochemistry  
Biochemical Genetics

Cell Physiology  
Bioinstrumentation  
Biometrics

***Microbiology and Genetics***

Bioinstrumentation  
Pathogenic Bacteriology  
Microbial Ecology  
Electron Microscopy  
Clinical Studies

Biochemical Genetics  
Advanced Microbiology  
Immunology  
Biochemistry  
Biometrics

**ASSISTANTSHIPS**

Qualified applicants are eligible for financial assistance in the form of fellowships, traineeships, research or teaching assistantships. Students admitted to the doctoral program are given priority for these awards. In addition to a stipend, all appointments are exempt from tuition during both the academic year and the summer session. Financial aid is usually available during the summer on a competitive basis.

**ADMISSION REQUIREMENTS**

Applicants with bachelor's degrees from accredited schools may be admitted to full graduate standing if their grades are well above the average required for the bachelor's degree. Those with lower averages may be considered for acceptance on a probationary status, in which case particular attention will be given to the last 60 semester hours of the undergraduate program. Applications for doctoral work are accepted from holders of the M.S. Admission to the Ph.D. program at the University of Dayton requires research experience equivalent to the M.S. thesis. Ordinarily, a student will not be accepted with full standing into a Ph.D. program unless funds are available for support.

Applicants should have the equivalent of the science and mathematics requirements of the University of Dayton's Bachelor of Science in Biology. These include one year of calculus, physics, and organic chemistry, plus sufficient background in biology to demonstrate a knowledge of cell biology, genetics, developmental, and environmental biology. Normally, a student who lacks more than one prerequisite will not be admitted to full graduate status. However, the summer session prior to entry can be used to remove a deficiency. Complete, current GRE scores (verbal, quantitative and analytical) are *required* of all applicants.

## **ADVISING**

Each new student is assigned a provisional advisor for assistance during the first semester. Prior to registration for the second semester each student selects a major professor, who serves as director of the student's advisory committee. The composition of this committee is representative of the general field of study in which the student expects to work.

The committee helps to plan the student's entire program. Prior to the beginning of the second semester of the M.S. program the student declares a choice of thesis or non-thesis option. The committee generally meets with the student twice a year to offer suggestions and to assess progress in the program and thesis research.

## **PROGRAM REQUIREMENTS FOR THE MASTER OF SCIENCE**

The M.S. degree requires 24 semester hours of work plus a thesis. A typical M.S. program includes in the 24 hours four semesters of BIO 601 (special topics in the area of specialization), BIO 552-553 (Biological Instrumentation), and supporting courses from the area of interest.

Students declaring the non-thesis option are required to complete 30 hours of course work and are expected to complete both BIO 552 and 553 in order to increase laboratory experience in the absence of thesis research. A research paper is required by the advisory committee.

All students are expected to attend BIO 501, Departmental Seminar, each semester. This is considered to be an important unifying experience for all aspects of the graduate program. In order to develop teaching skills, all students are required to teach at least one laboratory course during their time in residence and to enroll in EDS 604, College Teaching Seminar (1 semester hour). These requirements are waived only by the chairperson.

## **COMBINED B.S./M.S. PROGRAM IN BIOLOGY**

The B.S./M.S. in Biology is an accelerated, highly structured program that is designed for students who show an early interest in, and a strong potential for, research in the biological sciences. The combined program provides an undergraduate liberal arts education, a broad, basic background in the biological sciences, the development of expertise in a biological subfield, and thorough introduction to research instrumentation and techniques. Graduates from the program are prepared for either direct entry into the job market or for continuation toward the Ph.D. degree.

An early commitment to the program and utilization of 3rd Term sessions during the third and fourth years allows completion of all required B.S. and M.S. course work in five years. Normally the bachelor's degree is awarded at the end of the 1st Term of the fourth year. Qualifying examinations for master's candidacy take place during the 1st Term of the fifth year. The M.S. component of the combined program requires a research thesis. If the thesis work is underway during the fourth year it can ideally be finished by the end of the fifth year. The master's degree is awarded upon the successful defense of the M.S. thesis.



Potential applicants to the B.S./M.S. program in biology should declare their intentions to the department chairperson as soon as possible. Formal entry into the combined B.S./M.S. program should occur during the junior year. Details of application procedures, admissions criteria, curricula and financial support can be obtained directly from the Department of Biology.

## DOCTOR OF PHILOSOPHY

There are no set course requirements for the Ph.D. degree; each student follows the program outlined by the advisory committee. In practice most students find it helpful to take 80 to 90 semester hours of graduate course credits beyond the bachelor's degree to attain the level of competence suitable for a doctoral candidate. When it is desirable, a student will be encouraged to take some work at neighboring institutions or summer laboratories. As in the M.S. program, BIO 501, 552, 553 and 601 are required courses in the Ph.D. program.

## Ph.D. CANDIDACY EXAMINATION

This oral examination for Ph.D. students is administered by the advisory committee, which may be supplemented by members requested by the committee and/or the department chairperson. The examination will be taken no later than the student's sixth semester for full graduate standing or, for the student who has a master's degree in an appropriate field at the time of enrollment, no later than the fourth semester. The purpose of the examination is to judge the student's competence in the special area and in related fields. Following the examinations the student may be directed to (a) complete the dissertation, (b) strengthen preparation by demonstrating competence in one or more areas, (c) withdraw from the program. At the committee's discretion, additional competence in an area may be demonstrated by special examination or by completion of specific courses to the committee's satisfaction. The student is considered a candidate for the Ph.D. after successful completion of these requirements.

## DEFENSE OF THESIS OR DISSERTATION

- 1) The examination on the thesis, whether for the M.S. or the Ph.D., will constitute an oral examination on the subject matter of the thesis or dissertation.
- 2) For students electing the non-thesis option an oral examination is held over the subject matter of the research paper.
- 3) A Ph.D. student must present the dissertation for defense within *five* years after admission to candidacy or repeat the candidacy examination.
- 4) All those working toward the master's degree must complete the program within *five* years after admission to full graduate standing.

## TOOLS OF RESEARCH

Since the needs of the individual student vary with the background and type of research chosen, this requirement will be determined by the committee. The tools of research are normally for Ph.D. candidates only and, as

determined by advisory committees, may include one or two of the following: a reading knowledge of French or German or Russian or Spanish; an ability to program a digital or analog computer.

## **RESIDENCE REQUIREMENT**

A student is strongly advised to devote as much time as possible to graduate studies. Normally attendance at the University as a full-time student for one full year for the M.S. and for two full years for the Ph.D. will satisfy the residence requirement. If the advisory committee encourages attendance of a semester or a summer as a full-time student at a neighboring institution, that time may be applied to the residence requirement.

## **SEQUENCE OF EVALUATION**

The program is centered around development of professional competence. Each student is assessed in the following steps:

- 1) a preliminary diagnostic evaluation at the beginning of the program;
- 2) a qualifying examination at the beginning of the second year of full-time graduate study;
- 3) a candidacy examination over the area of specialization (Ph.D. students only); and
- 4) a defense of thesis.

The performance of each student is evaluated, at least yearly, in terms of overall progress toward obtaining the degree. A student judged to be making unsatisfactory progress may be placed on probation or dismissed from the program. Further details concerning the policies of the graduate program can be found in: *A Manual for Graduate Study in the Department of Biology at the University of Dayton*. A copy of this is given to every graduate student.

## **PRELIMINARY EVALUATION**

An orientation program introduces new students to the department. During this period, there will be an assessment of the student's background knowledge of cell biology, genetics, developmental biology, and environmental biology. According to the outcome of these examinations and after consultation with the faculty a student may be directed to enroll in one or more of the core undergraduate courses to provide a sufficiently broad base for a professional career. Normally no graduate credit is given for these courses.

## **QUALIFYING EXAMINATION**

At the beginning of the second full year of graduate work, the student will take a qualifying examination. The purpose of the examination is to aid the student's committee in planning the remainder of the program. The examination will cover basic biological concepts, subject matter of graduate courses taken, and broad areas of the student's specialty. The emphasis will be not only on facts but on the student's command of self-expression, ability to reason, and to integrate knowledge. Depending on the outcome of this examination, and overall performance during the first year, the student then completes the

requirement for the M.S. or withdraws from the program. Students showing outstanding ability and wishing to proceed toward the Ph.D. degree may be given the option of by-passing the M.S.

Students who choose to complete a master's degree are considered candidates for that degree after the qualifying examination. A student who wishes to continue beyond the master's degree will be advised to continue for the Ph.D. degree or to terminate studies at the University on the basis of the performance in earning the master's degree.

## COURSES OF INSTRUCTION

Certain undergraduate courses in biology and other science or engineering departments may be taken for graduate credit if recommended by the major advisor and approved by the biology chairperson and the Graduate Dean.

BIO 501. SEMINAR: Presentation of biological research data by staff members and visiting scientists. Required of all graduate students each semester. *0 sem. hr.*

BIO 502. VERTEBRATE ZOOLOGY: The morphology, physiology, ecology, and distribution of representative vertebrate groups. Three hours lecture per week. *3 sem. hrs.*

BIO 502L. VERTEBRATE ZOOLOGY LABORATORY. *1 sem. hr.*

BIO 505. MICROBIAL ECOLOGY: A study of the diversity of microorganisms and the interrelationships between microorganisms and their environments. Emphasis is placed on aquatic ecosystems. *3 sem. hrs.*

BIO 505L. MICROBIAL ECOLOGY LABORATORY: Examination of the methods of isolation and enumeration of microorganisms and techniques for determining their activities in the field and laboratory. *1 sem. hr.*

BIO 512. RADIATION BIOLOGY: Principles concerning the nature of ionizing radiation, its use in studying biological systems, and its effect on organisms. Two hours lecture, and two, two-hour laboratory periods per week. *4 sem. hrs.*

BIO 517. ENDOCRINOLOGY: Discussion of hormonal regulation of metabolism, growth and reproduction. Three hours lecture. *3 sem. hrs.*

BIO 517L. ENDOCRINOLOGY LABORATORY: Laboratory dealing with functional analysis of the mechanisms and activity of the endocrine system. *1 sem. hrs.*

BIO 521. BIOCHEMICAL GENETICS: An analysis of the nature of the gene and gene action. Particular attention will be given to genetic control of protein synthesis and to recent advances in biochemical and physiological genetics. Two hours lecture. *2 sem. hrs.*

BIO 521L. BIOCHEMICAL GENETICS LABORATORY: A laboratory to accompany BIO 521 employing an experimental approach to genetic problems. Students work the entire term on a project. *1 sem. hr.*

BIO 522. IMMUNOLOGY: Discussion of antigens, antibody, antigenicity, immunogenicity, and antigen-antibody reactions including hypersensitivity, immune tolerance and transplants. Biochemistry recommended. 3 sem. hrs.

BIO 523. ADVANCED MICROBIOLOGY: Lectures, readings and discussions of current concepts in basic and applied microbiology, with emphasis on modern methods of microbial taxonomy, major groups of bacteria, microbial ecology, and industrial fermentation. 3 sem. hrs.

BIO 524. CELL PHYSIOLOGY: The molecular basis for structure and function and energy transduction in animal and plant cells as well as the organization, function and development of membrane and subcellular organelles. 3 sem. hrs.

BIO 524L. CELL PHYSIOLOGY LABORATORY: Isolation and chemical characterization of cellular organelles, study of cell structure by light microscope. 1 sem. hr.

BIO 530. COMPARATIVE ANIMAL PHYSIOLOGY: Organized on a function-system basis, the course deals with environment-organism interaction and with integrative systems of the principal phyla of animals. 3 sem. hrs.

BIO 530. COMPARATIVE ANIMAL PHYSIOLOGY: Organized on a function-system basis, the course deals with environment-organism interaction and with integrative systems of the principal phyla of animals. 3 sem. hrs.

BIO 530L. COMPARATIVE ANIMAL PHYSIOLOGY LABORATORY: Laboratory to accompany BIO 530, must be taken concurrently with BIO 530. 1 sem. hr.

BIO 531. EXPERIMENTAL EMBRYOLOGY: Morphological and physiological aspects of development along with an introduction to teratology. Three hours lecture per week. 3 sem. hrs.

BIO 535. PROBLEMS IN FIELD BIOLOGY: A course designed to acquaint students with field-oriented problems in Biology. 1-3 sem. hrs.

BIO 538. POPULATION BIOLOGY: An advanced course considering the relationship of genetics and ecology. Emphasis on the growth and regulation of natural populations. Prerequisites: ecology and genetics. 3 sem. hrs.

BIO 538L. POPULATION BIOLOGY LABORATORY: Field and laboratory exercise to accompany BIO 538. 1 sem. hr.

BIO 540. PHYSIOLOGY OF HIGHER PLANTS: Uptake and transport of materials, energy metabolism, and growth in higher plants. Three hours lecture per week. 3 sem. hrs.

BIO 540L. PHYSIOLOGY OF HIGHER PLANTS LABORATORY 1 sem. hr.

BIO 546. PLANT DEVELOPMENT: Study of the major organ systems of the vascular plants with emphasis on the nature of their cell types and tissue composition and their patterns of development. 3 sem. hrs.

BIO 546L. PLANT DEVELOPMENT LABORATORY 1 sem. hr.

**BIO 550. BIOMETRICS:** The design and analysis of experiments in quantitative Biology. Rectilinear and curvilinear regression, correlation, and the distribution function of various statistics. *3 sem. hrs.*

**BIO 552. BIOLOGICAL INSTRUMENTATION:** The theory of separation, measuring and data handling techniques, and their applications to modern Biology. Required of all graduate students. Two hours lecture, and two, two-hour laboratory periods per week. *4 sem. hrs.*

**BIO 553. BIOLOGICAL INSTRUMENTATION:** A continuation of BIO 552. *2 sem. hrs.*

**BIO 554. ELECTRON MICROSCOPY:** A course covering the basic principles underlying the use of the electron microscope. Topics include different methods of preparing biological specimens for the electron microscope, their use in research, and interpretation of electron micrographs. *2 sem. hrs.*

**BIO 554L. ELECTRON MICROSCOPY LABORATORY:** Instruction and practice in the use of the electron microscope. Specimen preparation including fixation, dehydration, embedding and thin sectioning, and darkroom procedures are covered in this lab. *2 sem. hrs.*

**BIO 555. LABORATORY TECHNIQUES (TOPIC):** Advanced treatment of new techniques and instrumentation used in specialized areas of Biology. Changes with advances in a specialty reflected in the course title. *1-3 sem. hrs.*

**BIO 560. ADVANCED PLANT PHYSIOLOGY:** A treatment of several areas of plant physiology based on current research literature. Since the course is taught from current journals, the topics change. May be repeated. Prerequisite: a course in plant physiology. *2 sem. hrs.*

**BIO 564. PATHOPHYSIOLOGY:** The role of physiological stress in human physiology and its relation to the disease process. Attention to status assessment through the critical interpretation of clinical laboratory data. *3 sem. hrs.*

**BIO 564L. PATHOPHYSIOLOGY LABORATORY** *1 sem. hr.*

**BIO 566. BIOLOGY OF INFECTIOUS DISEASE:** The nature of infectious diseases; host-parasite interactions in resistance and infection; defense mechanisms (innate and acquired); immunologically mediated diseases; survey of bacteria, viruses, rickettsia, and chlamydia which cause disease in humans. *3 sem. hrs.*

**BIO 566L. BIOLOGY OF INFECTIOUS DISEASE:** Laboratory to accompany BIO 566. May be taken concurrently with, or following, BIO 566. *1 sem. hrs.*

**BIO 580. CLINICAL STUDIES (TOPIC):** Hospital or other clinical experience in patient-oriented areas of biology such as microbiology, mycology, immunology, parasitology and physiological chemistry. Permission required. *1-6 sem. hrs.*

**BIO 596. CURRENT BIOLOGY PROBLEMS:** The consideration of recent developments in biological thought and procedure. By permission of chairperson only. *1-3 sem. hrs.*

BIO 599. THESIS: Research for the master's degree. 3-6 sem. hrs.

BIO 601. SPECIAL TOPICS: The development, presentation, and discussion of topics in specialized areas of biology. Required of all graduate students each semester.

1 sem. hr.

BIO 699. DISSERTATION: Research for the doctoral degree. 3-6 sem. hrs.



Bruce Giffin, S.M.  
Department of Biology

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# CLINICAL LABORATORY TECHNOLOGY (CLT)

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Charles J. Chantell, Program Director

## ADVISORY STAFF

Margaret R. Carroll, M.A., M.T. (ASCP), Clinical Assistant Professor of  
Medical Technology, Miami Valley Hospital

Charles J. Chantell, Ph.D., Associate Professor of Biology,  
College of Arts and Sciences

Helen B. Frye, Ph.D., Professor of Teacher Education, School of Education

Shirley A. Pohl, M.A., M.T. (ASCP), Clinical Assistant Professor of  
Medical Technology, Good Samaritan Hospital

Harry A. Washing, Ph.D., Associate Professor of Management,  
School of Business Administration

The goal of the CLT program is to educate practicing clinical laboratory scientists (MT, CT, NMT) as specialists in either health science administration or health science education. The program emphasizes an interdisciplinary approach utilizing existing graduate and upper-level undergraduate courses from the College of Arts and Sciences, School of Business Administration, and the School of Education plus specialized clinical courses to add depth and breadth to the individual's graduate study. Each student's curriculum can be structured to meet specific needs and career objectives.

## ADMISSION POLICIES

The CLT program is open to students who:

- 1) Have earned a Baccalaureate degree in a health science field from an accredited institution,
- 2) Have had professional certification from the appropriate accrediting body, and
- 3) Have had clinical laboratory work experience in their professional specialty.

Formal acceptance into the CLT program will normally occur in the Fall. However, potential applicants can enroll in the Graduate School at any time as unclassified students. Courses taken during this time can be credited in the CLT program upon formal acceptance of the applicant.

Applicants may be admitted to full graduate standing if their grade point average is the equivalent of 2.9 or higher. Those with lower averages may be considered for acceptance on a probationary status. In the latter case particular attention will be given to the last sixty semester hours of the undergraduate program with special emphasis on grades in basic and clinical science courses.

Graduate Record Examination scores for the verbal, quantitative and analytical segments of the test are required for admission. Applicants should request that three letters of reference, preferably from academic and clinical sources,

be submitted to the Graduate Office. Along with the application form, a prospective student must submit a letter of not more than 1,000 words stating career objectives and reasons for entering the program.

## ADVISING

After formal acceptance into the program, each student is assigned a committee of three faculty from the advisory staff who reflect the student's area of interest. Initial course selections will be made by the student and the Program Director. Formal committee meetings will be held at the end of each academic year to plan an appropriate curriculum and to review progress. The committee and the student will develop, through written presentation, a project dealing with an administrative or educational aspect of laboratory function. After the completion of a minimum of 24 semester hours, a final meeting of the student and the Advisory Committee takes place. The purpose of this meeting is to evaluate the clinical project and administer a comprehensive examination. The format of this examination includes written and oral portions covering areas determined by the committee. Successful completion of this examination and positive assessment of completed work results in approval of the student's candidacy for the Master of Clinical Laboratory Technology degree upon completion of 30 semester hours of program course work.

## PROGRAM REQUIREMENTS

The CLT degree requires a minimum of 30 semester hours of course work. The overall structure of the program has three curricular groupings.

### GROUP I

	<i>Semester Credit Hours</i>
<b>Required Courses</b> .....	10 to 12
EDT 648      Techniques in Hospital Instruction .....	2
MBA 500D    Graduate Survey in Management and Organization .....	3
CLT 597	
or 598      Practicum in Clinical Laboratory	
Administration or Education .....	3
BIO 580      Clinical Studies (Topic) .....	1 to 2
BIO 601      Special Topics .....	1

The EDT and MBA courses are taken early in the program, the CLT and BIO courses are taken later in the program. The latter courses attempt to integrate academic theory with the reality of the clinical laboratory.

### GROUP II

**Science Electives** ..... 6 to 7

So as to maintain and strengthen technical skills, all CLT students must take two elective courses. These can be chosen from Biology and Chemistry graduate courses (and certain undergraduate courses) and include, but are not limited to, the following:



BIO 512 Radiation Biology  
 BIO 517 Endocrinology  
 BIO 521 Biochemical Genetics  
 BIO 522 Immunology  
 BIO 550 Biometrics

BIO 552 Bioinstrumentation I  
 BIO 553 Bioinstrumentation II  
 BIO 564 Pathophysiology  
 CHM 551 General Biochemistry I  
 CHM 552 General Biochemistry II

## GROUP III

### **Management/Education Electives** ..... 12 to 14

The remainder of each CLT student's program should emphasize the administrative or teaching end-goal. Appropriate courses from the College of Arts and Sciences and the Schools of Business Administration and Education include, but are not limited to, the following:

MGT 314 Personnel Management  
 MGT 440 Women in Management  
 MBA 500B Survey in Accounting  
 MBA 500E Survey in Statistics  
 MBA 500G Survey in Quantitative  
                     and Computer Methods  
 MBA 563 Management Informa-  
                     tion and Control Systems  
 MBA 571 Organizations and  
                     Their Environments  
 MBA 580 Organizational Theory  
 MBA 585 Organizational Systems  
 MBA 586 Interpersonal Dynamics  
                     in Organizations  
 MBA 587 Organizational Behavior  
 PSY 431 Interviewing and  
                     Counseling  
  
 EDC 530 Psychology of Individual  
                     Differences  
 EDC 531 Dynamics of Personality

EDT 501 Learning Theory and  
                     Education  
 EDT 502 Philosophical Studies  
                     in Education  
 EDT 503 Educational Research  
                     Methodology  
 EDT 507 Teaching and Learning  
                     Styles  
 EDT 538 Introduction to  
                     Computers  
 EDT 539 Computers in Education  
 EDT 540 Advanced Computers in  
                     Education  
 EDT 541 Methods: Computers in  
                     Education  
 EDA 513 Evaluation of Educational  
                     and Organizational  
                     Systems  
 EDT 637 Test Construction  
                     Measurement

The number of semester hours earned in Management or Education courses cannot exceed 49% of the total semester hours earned.

## COURSES OF INSTRUCTION

Descriptions of all above-mentioned courses, except CLT 597 and 598, can be found under the appropriate department or program headings in the graduate and undergraduate bulletins.

**CLT 597. PRACTICUM IN CLINICAL LABORATORY ADMINISTRATION:** Course is limited to four to seven students at one time: a personalized work study experience with a laboratory supervisor concentrating on patterns of work flow, requisition distribution, recording and reporting systems, emergency procedures, priority decision making, personnel work and time assignments, use of quality control data, and relationships with other hospital personnel. Prerequisite: MBA 500D. 3 sem. hrs.

CLT 598. PRACTICUM IN CLINICAL LABORATORY EDUCATION: Course is limited to four to seven students at one time: a personalized work study experience with an educational coordinator of a hospital medical technology program. Emphasis is placed on planning, structuring and evaluating learning experiences. An opportunity is afforded to relate educational theory to practice. Prerequisite: EDT 648. *3 sem. hrs.*

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## Department of **CHEMISTRY (CHM)**

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B. Lawrence Fox, Chairperson of the Department

The Department of Chemistry offers graduate programs leading to the Master of Science and the Master of Clinical Chemistry.

### **CHEMISTRY PROGRAM**

The purpose of the Master's program in Chemistry is to present a rigorous approach to modern theories in Chemistry and to increase the desire and potential for fundamental research through a program of literature search and laboratory experimentation.

Written examinations are given to assist the student and advisor in formulating the student's program.

### **ASSISTANTSHIPS**

Teaching assistantships normally requiring a maximum of 9 hours of laboratory instruction per week are available. The stipend for a 9-12 month appointment is supplemented by tuition remission for graduate course work. Appointment as a teaching assistant requires fluency in spoken English. Research assistantships in selected areas are sometimes available. Current availability may be ascertained by contacting the Chemistry Department.

### **ADMISSION REQUIREMENTS**

The undergraduate prerequisites are the minimum requirements specified by the American Chemical Society. Those students who have graduated from A.C.S.-approved schools will have fulfilled these requirements. Others may have to take certain courses concurrently from the undergraduate program to meet A.C.S. requirements. Complete, current Graduate Record Examination (GRE) scores, including the Advanced Chemistry examination, are recommended of all applicants and are required of all international students.

### **PROGRAM REQUIREMENTS**

Normally 30 semester hours are required for the Master of Science. These include 21-24 semester hours of course work and 6-9 semester hours of research. The course work hours must include at least three semester hours in each of

the major fields of organic, physical, and inorganic Chemistry. The student and advisor decide upon the remainder of the program. Electives in other departments may be chosen with the approval of the Chemistry department chairperson.

All candidates for the Master of Science are required to submit proof of their ability to do independent work. Normally this proof takes the form of a thesis. Additional course work may be substituted if the student has previously demonstrated research proficiency commensurate with the Master's degree as judged by the department.

## **BIOCHEMISTRY OPTION**

This option is designed for students planning careers in Biochemistry or the medical sciences. Those who want to specialize in Biochemistry should have undergraduate preparation in general, analytical, organic, and physical Chemistry. Applicants with an undergraduate degree in Biology together with a sufficient background in Chemistry are ideally suited for this program. The degree will require 30 semester hours, of which 21-24 semester hours are from approved course work and 6-9 semester hours are from thesis research.

## **CLINICAL CHEMISTRY PROGRAM**

The purpose of the program leading to the Master of Clinical Chemistry is to provide experienced clinical laboratory personnel with advanced training in basic Chemistry, analytical procedures, modern biochemistry, and clinical chemical research. It may also prepare the student for an advanced degree (Ph.D.) program in clinical Chemistry.

## **ADMISSION REQUIREMENTS**

All entering students must have prior work experience in a clinical laboratory. Typical students will have a Bachelor's degree in areas such as medical technology, Chemistry, Biology or premedicine/pre dentistry. Undergraduate course requirements include the equivalent of 2 semesters each of general and organic Chemistry and one semester each of quantitative analysis and physical Chemistry. Students lacking one of the requirements may be admitted on the condition that the deficiency is rapidly corrected by course work, no graduate credit being allowed.

## **PROGRAM REQUIREMENTS**

### ***Laboratory Experience***

The normal requirements for the Master's degree are 30 semester hours, with a minimum of 21 semester hours of approved course work and up to 9 hours for an approved thesis and oral defense of the thesis. Students with sufficient experience in clinical Chemistry research can petition for the non-thesis option, which requires 30 hours of course work. Approval of the department is required for waiver of thesis work. Students are required to pass an oral examination to prove competence in clinical Chemistry laboratory practices.

Each candidate, in consultation with an advisor, will select a program of study designed according to the student's goals and background, to fulfill the requirements for the Master's degree. The program, and any subsequent changes, must be approved by the department.

<b><i>Suggested Courses</i></b>	<b><i>Semester Hours</i></b>
CHM 517 Inorganic Chemistry .....	3
CHM 506, 506L *Identification of Organic Compounds .....	4
CHM 515, 515L Analytical Chemistry .....	3
CHM 551, 552 General Biochemistry I, II .....	6
CHM 555 Special Topics in Clinical Chemistry .....	1
CHM 557, 558 Applications of Clinical Chemistry I, II .....	2
CHM 512 Intermediate Organic Chemistry .....	3
CHM 550 Biometrics .....	3
CHM 560, 561 Research .....	6

\*CHM 507 must be taken by students who do not enroll in CHM 506.

## COURSES OF INSTRUCTION

CHM 504. SPECIAL TOPICS IN THEORETICAL CHEMISTRY: A treatment of topics selected from those normally surveyed in a one-year undergraduate course in Physical Chemistry such as electrochemistry, symmetry, spectroscopy, polymers, or others. Prerequisites: CHM 304, MTH 218 or equivalents. 3 sem. hrs.

CHM 506. IDENTIFICATION OF ORGANIC COMPOUNDS: Systematic study of the reactions of functional groups and of the physical and spectral properties of organic compounds leading to their identification. Two class periods per week. Prerequisite: CHM 313-314. 2 sem. hrs.

CHM 506L. IDENTIFICATION OF ORGANIC COMPOUNDS: Laboratory course to accompany CHM 506. Two three-hour laboratory periods per week. 2 sem. hrs.

CHM 507. INTRODUCTION TO SPECTROSCOPY: A lecture course that treats NMR, IR, and MS theory and interpretation. One class meeting per week. Prerequisite: CHM 314 or equivalent. 1 sem. hr.

CHM 512. INTERMEDIATE ORGANIC CHEMISTRY: Modern theory of organic Chemistry and reaction mechanisms. Prerequisite: CHM 314 or equivalent. 3 sem. hrs.

CHM 515. ANALYTICAL CHEMISTRY: Methods of analysis based on modern instrumentation including chemical, electrical and spectral methods. Prerequisites: CHM 201, 304 or 302. 2 sem. hrs.

CHM 515L. ANALYTICAL CHEMISTRY LABORATORY: A laboratory course to accompany CHM 515. 1 sem. hr.

CHM 517. INORGANIC CHEMISTRY: An introductory course. The fundamentals of modern inorganic chemistry including atomic structure, principles of structure and bonding, acid-based chemistry, periodicity, coordination compounds, nonaqueous solvents, electro-chemistry, molecular symmetry, and the chemistry of representative elements. 3 sem. hrs.

CHM 539. SPECIAL TOPICS IN PHYSICAL CHEMISTRY: Topics of current interest in areas such as chemical instrumentation, electronics, physical biochemistry, macromolecular Chemistry, and spectroscopy. 3 sem. hrs.

CHM 544. COORDINATION CHEMISTRY: Properties of transition metal ions, reaction mechanisms in coordination compounds, bioinorganic systems, electron transfer mechanisms, and the experimental tools common to coordination Chemistry. Prerequisite: CHM 517 or equivalent. 3 sem. hrs.

CHM 546. SPECIAL TOPICS IN MODERN ANALYTICAL CHEMISTRY: Modern analytical methods. Subject matter may include NMR, EPR, electroanalytical methods, GLC, mass spectrometry, IR and Raman spectroscopies, visible and ultraviolet spectrophotometric methods, X-ray techniques, ESCA and Auger spectroscopies, atomic absorption, and fluorescence. 3 sem. hrs.

CHM 550. SPECIAL TOPICS IN ORGANIC CHEMISTRY: Modern physical organic Chemistry, spectroscopy, photochemistry, molecular rearrangements, stereochemistry, and natural products. 3 sem. hrs.

CHM 551. GENERAL BIOCHEMISTRY I: The chemistry of proteins, carbohydrates, lipids, and nucleic acids. The metabolism of these compounds is related to bioenergetics, membranes, enzymes, and certain disease processes. Prerequisites: CHM 314 and 201. 3 sem. hrs.

CHM 552. GENERAL BIOCHEMISTRY II: Electron transport and oxidative phosphorylation, lipid metabolism, nitrogen metabolism, nucleic acid and protein synthesis, biochemical genetics, regulation, hormones, and nutrition. Prerequisite: CHM 551. 3 sem. hrs.

CHM 553. TOPICS IN BIOCHEMISTRY: Topics of current interest in biochemistry. Prerequisite: CHM 551 or 552 or permission of instructor. 1-3 sem. hrs.

CHM 554. DIRECTED READINGS 1-3 sem. hrs.

CHM 560-561. RESEARCH 0-9 sem. hrs.

CHM 562L. INTRODUCTORY BIOCHEMISTRY LABORATORY: Spectrophotometry; pH and dissociation; thin-layer, column, and paper chromatography; enzymology and enzyme purification, quantitative and qualitative techniques for studying proteins, amino acids, lipids, carbohydrates, and nucleic acids; and radioisotopic tracer techniques. Corequisite: CHM 551 or special permission of instructor. 2 sem. hrs.

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## Department of **COMMUNICATION (COM)**

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Donald B. Morlan, Chairperson of the Department  
Thomas Skill, Director of the Program

The graduate program of the Department of Communication leads to the Master of Arts.

The focus of the Department of Communication is upon symbolic processes in human communication. Such a focus is distinguished by the varied contributions of scholars in rhetoric, communication theory, and mass communication. A solid grounding in research, theory, message development and analysis will prepare graduates to assume positions in education, business, mass media, government, and professional organizations.

The general philosophy of the Department of Communication is focused on gaining knowledge and understanding through the spirited clash of ideas. As a community of scholars, we are willing to take inferential leaps from what is believed or known to what is probable or possible. A student needs to develop the ability to make such leaps and to develop a tolerance for ambiguity. To be uncertain suggests a willingness to entertain alternative explanations and views. However, scholars must make choices and be willing to risk those choices in confrontation with self and others. The department's graduate program and its forms of evaluation are designed to promote student growth and competency in the process of drawing and defending inferences related to human communication.

The master's student should begin study in the Department of Communication with the standard undergraduate competencies. If the student lacks such competencies, they should be developed prior to attempting the regular master's program. The master's program is designed to develop graduates with a variety of competencies of a more advanced nature than those possessed by the undergraduate and/or to provide a firm foundation for students who are encouraged to continue on for a Ph.D. Accordingly, persons receiving the master's degree from the Department of Communication must:

1. Have a thorough grounding in theories relevant to particular area(s) of interest, and have the ability to apply this knowledge to the solution of a variety of communication-related problems;
2. Have been exposed to a variety of research and analytical or critical methods, have a basic understanding of these, and have demonstrated a working command of at least one methodology; and
3. Have a basic knowledge of and appreciation for approaches to the study of communication from a variety of perspectives.

## **ASSISTANTSHIPS**

Graduate assistantships are available. The assistantships carry a stipend and a tuition remission for courses required for the degree. The assistantships are for 1 year with possible renewal for 1 additional year. No student can receive an assistantship for more than 2 academic years.

Assistantships in the department are, for the most part, teaching assistantships. However, some assistantships may carry a reduced teaching load when combined with other departmental responsibilities such as faculty research assistance.

The minimum requirements for assistantship in the department are:

1. The equivalent of an academic minor in communication and related areas or a demonstrated successful professional background in a communication-oriented occupation for a minimum of 3 years.
2. A 3.0 undergraduate cumulative point average (or the equivalent) and a 3.0 in the academic major or minor (Communication).

## ADMISSION REQUIREMENTS

1. The student seeking admission must have a bachelor's degree from a recognized institution of higher learning. In case of seniors who have almost completed undergraduate requirements, the graduate committee may permit the taking of graduate courses which will be applied to the master's degree only after the appropriate bachelor's degree has been awarded.
2. The student seeking admission should have a 3.0 undergraduate cumulative point average (or the equivalent). The graduate committee will recognize the potential merits of professional experience and/or maturity as they review an applicant's credentials.
3. The student seeking admission must take the Graduate Record Examination (GRE).
4. The student seeking admission will ordinarily have completed those studies required to develop the level of competency in communication necessary for pursuing the master's degree. The graduate committee will recognize demonstrated professional accomplishments in a communication field.

*NOTE: Students who do not meet the above requirements and yet wish to pursue the master's degree in the Department of Communication may, at the discretion of the graduate committee, be admitted on conditional status. **Conditional status** usually means completing 12 hours of graduate courses (including core courses COM 501, COM 503, and COM 536, all of which count toward the degree) with a grade point average of 3.25 or better. When the conditions are met, the student should request the department graduate director's office to send notification to the University Office for Graduate Studies. The Office for Graduate Studies will then grant the student regular status. Such conditions should be met within one year. A student may not become a candidate for a degree while in conditional status.*

5. Graduate credit from other accredited institutions of higher learning will be reviewed by the graduate committee. Transfer of such credit may be accepted up to a maximum of six semester hours.

## ADMISSION PROCEDURES

It is the applicant's responsibility to supply the following information necessary for a completed application:

1. The completed application form.  
Application forms may be obtained from the Office for Graduate Studies at the University of Dayton (300 College Park; Dayton, Ohio; 45469-0001).

2. Official transcripts of all undergraduate schooling (and graduate schooling where appropriate).
3. At least three letters of recommendation (at least two of these should be from professors familiar with the student's academic work).
4. Scores on the Graduate Record Examination (GRE).
5. Statement of goals: Please respond to the following:
  - Question one: What topics, problems, or areas of communication do you wish to investigate in your master's program?
  - Question two: What education and personal experiences have led you to want to investigate these topics, problems, or areas at the University of Dayton?
  - Question three: What in your educational background has prepared you to enter the Department of Communication at the University of Dayton?
  - Question four: What are your career goals?
  - Question five: What other information about your background and experiences would be helpful to the Department of Communication in making an admissions decision?

## PROGRAM OPTIONS AND REQUIREMENTS

### General Requirements

The department's master's program is based on the satisfactory completion of a minimum of 30 to 36 semester hours of credit distributed as follows:

- I. At least 24 hours of credit must be taken within the Department of Communication.
- II. Up to 12 hours of credit may be scheduled outside the department (with approval of advisor).
- III. COM 501, COM 503, and COM 536 must be completed with a grade of "B" or better in each (3.0 GPA must be maintained to graduate).
- IV. Three or six hours of research credit is scheduled by each master's candidate writing the thesis.

*NOTE: It is expected that each master's student enrolls in COM 501, COM 503, and COM 536 as early as possible.*

*Demonstration of satisfactory progress toward the degree includes the requirement that students maintain a minimum average of B (3.00) in course work. Students who fail to meet this requirement are either placed on academic probation or dropped from the program.*

*Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement are dismissed from the program.*

## ADVISOR SELECTION

The faculty believes that the advisor should be chosen by the student. A temporary advisor will be assigned to assist the student with initial enrollment and program planning. The student is encouraged to select a permanent advisor before the middle of the second semester of the program in time for third semester registration. The student must also consult the faculty member chosen and gain his/her approval before the faculty member will be appointed as



permanent advisor. Subsequent changes of advisor require the approval of the graduate director's office.

## **PROGRAM OPTIONS**

After selecting a permanent advisor, the student and the advisor should agree on the choice of the other members of the advisory committee, which should include the advisor and two other faculty members at the rank of assistant professor or higher.

The student should submit a proposed program plan (on the forms provided by the office of the graduate director) no later than the end of nine credit hours. A copy of the proposed program should be on file in the graduate director's office.

The advisory committee will conduct a mid-program review of the student's progress toward the degree. The time of this review should be specified during the initial program planning meeting, however it should take place by the time fifteen credit hours are completed.

## **PLAN A—COMMUNICATION NON-THESIS OPTION**

All students not choosing to write the thesis must take the comprehensive examination during their last semester of classes. The comprehensive examination consists of a minimum of six hours of written examinations prepared by the student's advisory committee and a one-hour oral defense. The form and content of the written examination will be determined by the advisory committee. The examination will be written without notes at a time and place specified by the office of the graduate director. The oral examination is given after satisfactory completion of the written examination. Students will prepare for the oral examination by consulting members of the advisory committee concerning performance on the written examination.

Should a student fail a part of the written examination, that part of the examination may be re-taken, provided the student's advisory committee recommends a second attempt. Should the student fail the oral examination, the oral examination may be re-taken, providing the student's advisory committee recommends a second attempt. In either case, the second attempt will be final. Second time failure of written or oral examinations will require a majority vote of the student's advisory committee.

## **PLAN B — COMMUNICATION: THESIS OPTION**

Students choosing to write the thesis must take the comprehensive qualifying exam at the completion of twenty four credit hours of coursework. At the completion of the comprehensive examination, the student will register for three hours of thesis credit and will prepare a thesis prospectus.

The thesis should report original research on some important question relevant to the study of communication. The prospectus should present a thorough review of the relevant literature and a rationale for the proposed study, culminating in research questions or hypotheses. The prospectus should also include a detailed description of the methods to be used in the research as well as suggested analytic techniques.

The prospectus will be developed in consultation with the thesis advisor,

although the student must have the methodological competence necessary to complete the proposed project. Once the prospectus is approved by the advisor, it must be presented to the advisory committee for approval. The completed prospectus will constitute the first half of the thesis and serves, essentially, as a contract between the student and the committee.

*NOTE: The prospectus should be completed within six months of passing qualifying exams.*

After the prospectus has been approved, the student will register for an additional three hours of thesis credit while completing the thesis. The student will then collect and analyze the data required to answer the questions raised in the prospectus. Once this has been completed, the prospectus will become the first half of the thesis, followed by a chapter reporting the results of the study and a chapter discussing the implications of those results. The thesis will be revised until the advisor considers it satisfactory, at which time it will be presented to the members of the advisory committee, who will orally defend the thesis in an examination conducted by the advisory committee. The master's degree is not completed until the thesis has been approved by the committee.

Should a student fail the final oral defense, the thesis may be defended again, provided the student's advisory committee recommends a second attempt. The second attempt to defend the thesis will be final. Failure of the second oral defense will require a majority vote of the student's advisory committee.

## **PLAN C—COMMUNICATION/INTERDISCIPLINARY**

Courses in business administration, English, psychology and political science have been designated for Communication/Interdisciplinary study leading to the Master of Arts.

Students take 36 semester hours of course work; 24 of those hours must be in communication and 12 of those hours in one of the interdisciplinary areas. Students are required to write a comprehensive 6-hour examination over their communication and interdisciplinary course work. The examination cannot be taken until students have successfully completed 27 semester hours of course work. The oral examination is given after satisfactory completion of the written examination. Students will prepare for the oral examination by consulting members of the advisory committee concerning performance on the written examination.

Should a student fail a part of the written examination, that part of the examination may be re-taken, provided the student's advisory committee recommends a second attempt. Should the student fail the oral examination, the oral examination may be re-taken, providing the student's advisory committee recommends a second attempt. In either case, the second attempt will be final. Second time failure of written or oral examinations will require a majority vote of the student's advisory committee.

## COURSES OF INSTRUCTION

COM 501. COMMUNICATION RESEARCH AND METHODS: Introduction to the study of communication research and methods. Required course for all communication graduate students. *3 sem. hrs.*

COM 502. METHODS OF RHETORICAL CRITICISM: Critical survey and application of traditional to contemporary methods of rhetorical criticism. Prerequisite: COM 501. *3 sem. hrs.*

COM 503. COMMUNICATION RESEARCH SEMINAR: Focused study on the methods and process of conducting communication-related research. Builds upon fundamentals covered in COM 501. Required course for all communication graduate students. Prerequisite: COM 501. *3 sem. hrs.*

COM 506. ETHICS OF COMMUNICATION: Investigation and application of the general ethical principles of persuasion and the special problems related to professional areas: platform and business communication, electronic and print journalism, public relations, classroom communication, and forensic behavior. *3 sem. hrs.*

COM 508. INTERPERSONAL COMMUNICATION: Focus on the theories, concepts, constructs, and research related to the process of interpersonal communication. *3 sem. hrs.*

COM 511. THEORIES OF PERSUASION: An examination of the major approaches to the study of persuasion from classical rhetorical to contemporary behavioral theorists. *3 sem. hrs.*

COM 515. LANGUAGE AND MEANING: Focuses on the origin and development of language and meaning. Comprehensive exploration of the many perspectives and theories of language and meaning. *3 sem. hrs.*

COM 517. ORGANIZATIONAL COMMUNICATION: A study of communication activities within organizations: theories and systems of organizational communication, internal communication systems, research methods, and the interface of management and communication. *3 sem. hrs.*

COM 521. THE INVESTIGATION OF LISTENING PROBLEMS: Examination of listening theory and problems with implementation through research performed in the students' prospective professional areas. Major objective is the improvement of listening techniques. *3 sem. hrs.*

COM 525. COMMUNICATION TRAINING & DEVELOPMENT: Explores the theories, methods, and practice of developing, instituting, and evaluating communication training and development programs. *3 sem. hrs.*

COM 526. COMMUNICATION CONSULTING: Explores the theories, methods, and practice of developing, instituting, and evaluating communication consulting programs. *3 sem. hrs.*

COM 527. SMALL GROUP COMMUNICATION: An examination of the theoretical and practical aspects of small group communication. Topics include: communication and decision-making, communication and conformity, and within-group communication. *3 sem. hrs.*

COM 530. DEVELOPMENT OF MASS MEDIA: History and analysis of the development and interdependence of mass media; print and electronic. Emphasis on its role and responsibility in political and economic progress of U.S. 3 sem. hrs.

COM 531. DIRECTED STUDY IN COMMUNICATION: An intensive study of a specialized area of communication selected through consultation with the instructor. Permission. May be repeated once. 3 sem. hrs.

COM 536. THEORIES AND MODELS OF COMMUNICATION: Survey and analysis of current theories and models of communication. Required course for all communication graduate students. 3 sem. hrs.

COM 537. CONFLICT RESOLUTION THROUGH COMMUNICATION: An analysis of the different methods of communication employed to resolve conflicts. Types of conflict include: marital conflict; role conflict; and societal conflict. 3 sem. hrs.

COM 540. LAW AND NEWS MEDIA: Limitations of freedom of the press. The right of the people to know and the news media to report, within limits of decency, fair comment, and privacy. Censorship. Off the record material. Libel laws. Copyright restrictions. Postal regulations. 3 sem. hrs.

COM 547. SEMINAR IN HEALTH COMMUNICATION: An examination of communication theory and research as it relates to health care. Issues include reassurance, the role of the patient, interviews, health organizations, the media and health, compliance, providing explanations, and health care professions frequently neglected. 3 sem. hrs.

COM 555. PUBLIC RELATIONS: Focuses on the theoretical principles behind the current-day practice of public relations. Special emphasis on public opinion, diffusion, persuasion, problem analysis, and audience assessment within the PR contest. 3 sem. hrs.

COM 562. TOPICS IN COMMUNICATION: Selected topics in communication, for example: mass communication, historical and contemporary public address and criticism. May be repeated when topic and instructor change. 3 sem. hrs.

COM 566. ARGUMENTATION: Principles of argumentation and logic are applied during construction of a professional brief. Oral proficiency stressed. 3 sem. hrs.

COM 570. MASS COMMUNICATION THEORY: An examination of the theories, models, and perspectives relevant to the study of mass communication. 3 sem. hrs.

COM 571. MASS COMMUNICATION EFFECTS: An examination of the historical and current research as it relates to our understanding of the process and effects of mass communication. 3 sem. hrs.

COM 591. PUBLIC RELATIONS PRACTICUM: Investigation and application of communication principles as students plan and implement a public relations campaign for an established organization. 3 sem. hrs.

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**Department of**  
**COMPUTER SCIENCE (CPS)**

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Jack E. Kester, Chairperson of the Department  
Leon E. Winslow, Director of the Program

The graduate program in the Department of Computer Science leads to the degree of Master of Computer Science (MCS). This is a professional degree program designed primarily for the manager, engineer, educator, or technician involved in computer-related activities. Students whose undergraduate education is in a field other than computer science are encouraged to apply. Certain undergraduate computer science prerequisites are required for admission to the graduate program (see **ADMISSION REQUIREMENTS**). The program serves both full-time and part-time students and accommodates both professionally oriented students and persons committed to teaching in secondary schools or community colleges.

## **ASSISTANTSHIPS**

Graduate assistantships are offered to qualified students in the MCS program for assisting with or teaching sections of introductory computer science courses. The assistantship is essentially an apprenticeship in the introductory aspects of structured programming and algorithm construction. Competent assistants making satisfactory progress toward the degree can normally renew their assistantships for a second year. Recipients are expected to complete the requirements for the master's degree in two years. Assistants contribute half-time service of 20 hours per week. Stipends and complete tuition remission for six semester hours per term are provided. Detailed information and forms for application may be obtained from the Computer Science Department.

## **ADMISSION REQUIREMENTS**

The student seeking admission should have a bachelor's degree from an accredited institution of higher education with a cumulative grade point average of 3.00 out of 4.00. For success in the program the student should have the equivalent of at least one year of college mathematics which is normally calculus. Many of the graduate courses have, in addition to the calculus, topics such as linear algebra, statistics, and discrete mathematics as prerequisites.

For admission to the program, the student must demonstrate better than average knowledge of algorithm construction and its implementation on a digital computer in a structured procedure-oriented language, of assembly programming, and of data structures. These requirements can be met by completing the following undergraduate courses (or their equivalents): CPS 150 Algorithms and Programming I, CPS 151 Algorithms and Programming II, CPS 250 Algorithms and Programming III, and CPS 350 Data Structures and Algorithms, with a minimum cumulative grade point average of 3.2. The

graduate committee of the department will recognize the potential merit of professional experience and/or maturity as it reviews an applicant's credentials.

A student deficient in the undergraduate prerequisites but meeting other admission requirements may be admitted conditionally. A maximum of 9 graduate credits may be earned while in this status. It is the responsibility of the student to apply for regular status upon completion of all prerequisites. Graduate credit from other accredited institutions of graduate learning will be reviewed by the graduate committee. Transfer of such credit may be accepted up to a maximum of six semester hours.

## **PROGRAM REQUIREMENTS**

The degree requires 36 semester hours, 24 of which must be taken from computer science courses numbered 510 or above, including CPS 530, CPS 531, and CPS 536. The remaining 12 semester hours may be selected from graduate courses of other departments of the university or from other CPS courses numbered 510 or above.

A minimum of a two semester sequence must be elected when courses are selected from departments other than computer science. Each student's program requires the advance approval of a faculty advisor and will require a series of core courses in the specific area of interest of the student. A student failing to make normal progress will be required to withdraw from the program. There is no formal thesis requirement and no foreign language requirement.

## **APPLICATION**

An application for admission to graduate studies in computer science may be obtained from the Office for Graduate Studies, room 200 St. Mary's Hall, University of Dayton 45469. The application, a transcript of credits, and three letters of recommendation must be returned to the Office for Graduate Studies.

## **INTERNATIONAL STUDENTS**

Students from foreign countries should request information and applications for admission to graduate studies from the Office of International Services. A score of 550 or better is required on the TOEFL exam for those for whom English is a second language. A student from a foreign country seeking admission must have earned at least a bachelor's degree or its equivalent. For further details see International Services.

## **FACILITIES**

The computing facilities available to the students can be categorized into two types: those provided by the Office for Computing Activities and those provided by the Computer Science Department proper.

Specifically, the Computer Science Department has three NCR Tower/600 computers interconnected via ETHERNET and serving a total of 48 users in our two new laboratories in Anderson Center. These two new laboratories house

16 terminals, 38 NCR PC-8 microcomputers, some printers and a graphics plotter. The Computer Science Department also has a laboratory of 30 IBM PC computers and a laboratory for digital electronics and for microcomputer interfacing. Several different Local Area Networks are employed in these laboratories.

The Office for Computing Activities provides general educational computing facilities available to all university students. These facilities include VAX 11/780 and 8600 computers in a cluster arrangement which are used for some of our courses.

Both of these systems provide access to a large variety of application packages and programming languages. Round-the-clock telephone dial-up service to either system is available to those students with appropriate equipment to access them.

## COURSES OF INSTRUCTION

Courses numbered 510 and above have specific prerequisites. It is the students' responsibility to ascertain that they possess the necessary prerequisites for the courses for which they register. Students not having the necessary prerequisites will be required to withdraw from the course.

**CPS 502. COMPUTING — GENERAL SURVEY:** A nontechnical introduction to the history and organization of digital computers. Survey of the diverse applications of computers in government, business, education, and the arts. Discussion of the psychological and sociological impact of the computer and information age and related ethical issues. Primarily for students in the humanities and in education.

*3 sem. hrs.*

**CPS 509. TOPICS IN COMPUTER SCIENCE:** Lectures in special areas of interest determined by the department. May be taken more than once for additional credit when the topics or contents change. Prerequisite: permission of the department. By arrangement.

*1-3 sem. hrs.*

**CPS 510. SYSTEMS ANALYSIS:** Systems development life cycle, systems analysts and their environment, tools of the analysts; data flow diagrams, data dictionaries, analyzing process logic; the HIPO technique; normalization; file and data base organization; project management techniques (PERT). Prerequisite: programming ability in a structured procedure oriented language, CPS 350.

*3 sem. hrs.*

**CPS 512. SYSTEMS DESIGN:** Introduction to software design methodologies, especially structured design; software productivity; topics related to mainframes, minis, micros, data base, data communications, distributed data processing, project management, privacy and security of automated systems. Prerequisite: CPS 510.

*3 sem. hrs.*

**CPS 514. MANAGEMENT INFORMATION SYSTEMS:** The systems approach to managing information; MIS organization within the company; application of organizational behavior to MIS; manager's view of computer systems; planning, designing, and implementing the MIS; advanced concepts of MIS. Prerequisite: CPS 510.

*3 sem. hrs.*

**CPS 518. SOFTWARE ENGINEERING:** The course explores major issues of software engineering, comparison of various manual/automated analysis and design methodologies, modern programming language features, software metrics and human factors in software development. Prerequisite: CPS 512. 3 sem. hrs.

**CPS 528. DISCRETE STRUCTURES:** Survey of various mathematical topics with applications to computer science, e.g. graph theory, Boolean Algebra, formal logic. MTH 361. 3 sem. hrs.

**CPS 530. ALGORITHM DESIGN:** Concepts of data and their use in the systematic design, implementation, and maintaining of software systems including formal analysis and verification of systems. Prerequisite: CPS 350. 3 sem. hrs.

**CPS 531. SOFTWARE ENGINEERING PROJECT:** Students, either individually or in small teams, must design and implement a software system carefully specified to illustrate the basic concepts and techniques of software engineering. Regular meetings are required where oral and written progress reports are presented and critiqued. This is the practical continuation of the theory of CPS 530. Prerequisite: CPS 530. 3 sem. hrs.

**CPS 532. DATA STRUCTURES:** Review of basic data concepts, linear lists, strings, arrays, and orthogonal lists, trees and graphs, multilinked structures, searching and sort techniques. Algorithm design and analysis, memory design, system design, accessing methods, run time cost and efficiency. Prerequisite: CPS 530. 3 sem. hrs.

**CPS 536. OPERATING SYSTEMS:** Study of operating system principles and the functions of data, job, and task management. Prerequisite: CPS 350. 3 sem. hrs.

**CPS 538. OPERATING SYSTEM PRINCIPLES:** Models and algorithms pertinent to the design of computer operating systems; concurrent processes including synchronization, communication, and deadlock problems; process and device scheduling policies, design of file systems, reliability and protection. Prerequisites: CPS 536. 3 sem. hrs.

**CPS 542. DATA BASE MANAGEMENT SYSTEMS:** Physical and logical organization of data files; hierarchical, network, and relational data base models; data definition language and data manipulation language of a commercial data base management system such as IDMS; query languages. Prerequisites: COBOL and CPS 350. 3 sem. hrs.

**CPS 543. COMPARATIVE LANGUAGES:** The evolution of programming languages. The study of the concepts common to languages, constructs, organization, specification, and analysis of languages. The role of languages in software development. Prerequisite: CPS 350. 3 sem. hrs.

**CPS 544-545. SYSTEMS PROGRAMMING:** Analysis of compilers and their construction; programming techniques discussed in the current literature; advanced computer applications in both mathematical and nonnumeric areas. Prerequisites: CPS 530, 536. 6 sem. hrs.

**CPS 552. DISCRETE EVENT SIMULATION TECHNIQUES:** Simulation models; random number generation testing, special purpose simulation languages, statistical analysis of output; regenerative models; trace-driven models. Emphasis on models related to computer operating system design and performance evaluation. Prerequisites: CPS 350, MTH 367. 3 sem. hrs.



CPS 553-554. NUMERICAL METHODS: Solution of nonlinear equations, interpolation and approximation, differentiation and integration, systems of linear equations, eigenvalues, eigenvectors, and introduction to solution of ordinary differential equations. Emphasis placed on applications. Prerequisites: CPS 132 or 150 and MTH 119.

3 sem. hrs.

CPS 555-556. NUMERICAL ANALYSIS: Functional approximation, quadrature methods, numerical solution of differential equations; matrices and large scale systems, modern iterative matrix methods; minimax approximations; data smoothing. Prerequisites: CPS 132 or 150, MTH 302, 319.

6 sem. hrs.

CPS 560. COMPUTER GRAPHICS: Types of graphic hardware and their characteristics. Overview of software and techniques used in computer graphics. Two and three dimensional graphics displays. Prerequisites: programming ability in a procedure-oriented language, MTH 302, 319, CPS 350.

3 sem. hrs.

CPS 570. DATA COMMUNICATIONS: The study of networks of interacting computers. The analysis of distributed processing and distributed data bases. Prerequisites: CPS 346.

3 sem. hrs.

CPS 572. COMPUTER NETWORKING: A unified view of the broad field of local area and long haul networks. A survey of the state of the art. Topics covered include networking theory, design approaches, standards, topologies and protocols. Prerequisites: CPS 536, 570 and MTH 367

3 sem. hrs.

CPS 577-578. COMPUTER SYSTEM DESIGN: Introduction to design and analysis of combinational and sequential circuits of MSI devices to design arithmetic and other computer functions. Analysis of a specific microcomputer architecture including usage of its machine and assembler language. Interfacing of various components with computers. Prerequisites: CPS 250, PHY 207.

6 sem. hrs.

CPS 580. ARTIFICIAL INTELLIGENCE: Presentation of theoretical concepts for Artificial Intelligence in the areas of knowledge representation and search techniques. These are examined in the context of applications for expert systems, semantic networks and robotics planning problems. Issues concerning functional programming and logic programming are also presented. Prerequisites: CPS 350, LISP.

3 sem. hrs.

CPS 582. AUTOMATA THEORY: Finite automata, sequential machines. Turing-machines, computability, existence of self-reproducing machines. Prerequisite: CPS 528.

3 sem. hrs.

CPS 591. SPECIAL RESEARCH PROBLEMS: Individual readings and research in a specialized area. May be taken for at most 6 semester hours. Prerequisite: permission of the department. By arrangement.

1-3 sem. hrs.

CPS 592. SPECIAL TOPICS: Lectures and/or laboratory experience in some areas determined by the department. May be taken for at most 6 semester hours. Prerequisite: permission of the department. By arrangement.

1-3 sem. hrs.

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**Department of  
ENGLISH (ENG)**

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R. Alan Kimbrough, Chairperson of the Department

The program leading to the Master of Arts with a major in English offers advanced study of English and American literature, language, and writing.

The program serves both full-time and part-time students. Besides the traditional courses in English and American literature, it offers special courses in subjects such as applied rhetoric, composition and literature pedagogy, and minority literature. Thus the program accommodates both prospective Ph.D. students and persons committed to teaching in secondary schools or community colleges, as well as liberal arts students eager to develop research skills, writing skills, and literary judgment.

### **ASSISTANTSHIPS**

Graduate assistantships are offered to qualified students in the M.A. program for teaching required sections of basic freshman courses. The assistantship is essentially an apprenticeship in teaching, and most assistants gain experience in both traditional freshman composition and proficiency-based courses. Competent assistants making satisfactory progress towards the degree can normally renew their assistantship for a second year.

### **ADMISSION REQUIREMENTS**

Students seeking admission must have completed studies in English and American literature which will enable them to pursue graduate studies with distinction. Students will ordinarily have completed, with a grade point average of at least 3.0, 24 semester hours in literature, of which at least 18 are in upper-division courses.

### **PROGRAM REQUIREMENTS**

Normally 30 semester hours are required. Every applicant who, after 12 hours of graduate work, has attained a grade point average of at least 2.75 will be given a Diagnostic Examination; this examination will be reviewed with the candidate by the candidate's advisor and two other members of the graduate faculty. They will also review, at this time, the candidate's academic background and comments by faculty members who have had the candidate in classes. On the basis of this material and the review, the committee will make recommendations about the candidate's graduate program to the chairperson; among these recommendations will be the total number of hours the candidate needs for completion of the degree. Exceptionally well qualified students may earn the master's degree in fewer than 30 semester hours; students with deficiencies may be required to take up to 36 semester hours of graduate study.

ENG 601, Research and Bibliography, is required of each applicant for the degree. ENG 588, Studies in Criticism, is required of each applicant who has not had a satisfactory undergraduate course in literary criticism. Students in the program must take at least 12 hours of 600-level courses (including ENG 601).

Because the Master of Arts is not a specialist degree, candidates must take a balanced program of courses. Normally such a program will include a balance of early and later literature and of English and American literature or a balance of literature, writing, and teaching.

A thesis upon a topic approved by the Graduate Committee of the department, for which six semester hours of credit are granted, can be accepted if the interview committee recommends this option.

## COURSES OF INSTRUCTION

Prerequisite for enrolling in any of the following courses for credit is at least 24 semester hours in literature. All 600-level courses normally meet for two hours but yield three semester hours of credit. The starred courses (\*) may be repeated for graduate credit when the topics or contents change.

ENG 505. CREATIVE WRITING\*: Supervised practice in various literary forms. Both group discussions and individual conferences and critiques. Permission of chairperson required. 3 sem. hrs.

ENG 507. STUDIES IN WRITING\*: Special topics in composition, argumentation, technical writing, report writing, and the like. 1-6 sem. hrs.

ENG 514. MEDIEVAL ENGLISH LITERATURE: A study of the dominant types in the literature of England from the beginning to 1500. 3 sem. hrs.

ENG 515. CHAUCER: A study of the life, the times, and language of Chaucer. The main concentration is on *The Canterbury Tales* as rendered in Middle English. 3 sem. hrs.

ENG 522. EARLY RENAISSANCE LITERATURE: A survey of the literature of the sixteenth century from Thomas More to Sidney and Spenser. 3 sem. hrs.

ENG 524. SHAKESPEARE\*: A study of significant aspects of Shakespeare's plays and poems. 3 sem. hrs.

ENG 532. LATER RENAISSANCE LITERATURE: A survey of the literature of the early seventeenth century from Bacon, Jonson, and Donne to Marvell, exclusive of Milton. 3 sem. hrs.

ENG 536. STUDIES IN DRAMA TO 1642\*: Studies in English drama from the beginning to the closing of the theatres. 3 sem. hrs.

ENG 538. MILTON: A study of the major and minor poems and of selected prose of Milton. 3 sem. hrs.

ENG 542. STUDIES IN NEO-CLASSICAL LITERATURE\*: Studies in literature from Dryden to Johnson. 3 sem. hrs.

ENG 552. ENGLISH ROMANTICISM: A study of the major poets and critics of the Romantic Age. 3 sem. hrs.

- ENG 556. STUDIES IN NINETEENTH-CENTURY LITERATURE\*: A study of the literature in England in the nineteenth century. 3 sem. hrs.
- ENG 560. TWENTIETH-CENTURY BRITISH LITERATURE: A consideration of significant developments in modern British literature. 3 sem. hrs.
- ENG 572. AMERICAN ROMANTICISM: A study of significant developments in American literature of the mid-nineteenth century. 3 sem. hrs.
- ENG 576. MAJOR AMERICAN WRITERS\*: An intensive comparative study of two or three American writers. 3 sem. hrs.
- ENG 580. AMERICAN REALISM AND NATURALISM: A study of representative writers from the post-Civil War period in American literature. 3 sem. hrs.
- ENG 584. STUDIES IN TWENTIETH-CENTURY AMERICAN LITERATURE\*: A study of significant developments in American literature of the twentieth century. 3 sem. hrs.
- ENG 588. STUDIES IN CRITICISM\*: A treatment of significant topics in theoretical and/or practical criticism. 3 sem. hrs.
- ENG 590. TEACHING OF COLLEGE ENGLISH: Discussion, instruction, and practice in the methods of teaching composition and literature. Required of and open only to assistants. 1 sem. hr.
- ENG 591. STUDIES IN LITERATURE\*: An analysis of selected literary problems or areas. 1-6 sem. hrs.
- ENG 592. HISTORY OF ENGLISH: A study of stages in the development of the English language and of influences shaping its development from the beginning to the present time. 3 sem. hrs.
- ENG 594. THE STRUCTURE OF ENGLISH: Studies in the grammatical structure of modern English in the light of historical development. Traditional and modern linguistic points of view considered. 3 sem. hrs.
- ENG 596. COMPOSITION THEORY: Study of the principal current theories of composition, with application to the teaching and evaluating of writing. 3 sem. hrs.
- ENG 599. THESIS 3-6 sem. hrs.
- ENG 601. RESEARCH AND BIBLIOGRAPHY: An introduction to the methods and tools of literary scholarship. Required of all degree applicants. 3 sem. hrs.
- ENG 605. STUDIES IN AN AUTHOR\*: A consideration of the body of an author's work and its relationship to the life of the author. 3 sem. hrs.
- ENG 609. STUDIES IN A GENRE OR MODE\*: An intensive analysis of a significant literary form or mode. 3 sem. hrs.
- ENG 613. STUDIES IN A LITERARY MOVEMENT\*: An analysis of a significant literary school, group, or movement. 3 sem. hrs.

ENG 621. STUDIES IN THE TEACHING OF LITERATURE\*: An exploration of ways to teach literature more effectively for particular students. 3 sem. hrs.

ENG 625. STUDIES IN THE TEACHING OF COMPOSITION\*: An exploration of ways to teach writing more effectively for particular groups of students. 3 sem. hrs.

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## Department of HISTORY (HST)

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Roberta S. Alexander, Chairperson of the Department

The Department of History through its graduate program seeks to develop in students that combination of mature judgment and scholarly competence associated with the ability to conduct research, to write effectively, and to evaluate historical conclusions and interpretations. As a secondary purpose, the program is designed to prepare students for successful careers especially in teaching and government services.

### ADMISSION REQUIREMENTS

Applicants for the graduate program in history must have completed a total of twenty-four semester credit hours of history, and achieved a grade point average of at least 3.00 in all history courses.

### ASSISTANTSHIPS

Graduate assistantships are available. The assistantships carry a stipend and tuition remission for courses required for the degree. The assistantships are for one year with possible renewal for an additional year. No student can receive an assistantship for more than two academic years.

Graduate assistants generally provide instructional service by way of grading, teaching, and counseling students under the supervision of a professor. They may also be required to provide research services. In the second year of an assistantship, graduate students may be allowed to teach survey courses.

### PROGRAM REQUIREMENTS

A research seminar (HST 601) is required of all students. In addition, the candidate must take at least three other 600-level courses (one of which must be a graduate seminar [HST 610-680]). No more than two independent study courses (HST 696) may be taken with the same professor.

Up to six semester hours of work may be taken outside the History Department with the approval of the chairperson.

There is a written examination covering the minor field and an oral examination covering the major area. For details about these examinations and

on the fields examined, consult the most recent "Graduate History Information Sheet" in the History Department's office.

A proficiency examination in a foreign language is required of all graduate work. The student may choose to show competence in any foreign language that is pertinent to the major program.

The master's program may be completed under either of the two following options:

### **Option A**

Thirty semester hours of acceptable course work and research are required. These must include three semester hours for the research seminar (HST 601), six semester hours for the thesis (HST 699), and at least nine semester hours earned in other 600-level courses (one of which must be in a graduate seminar [HST 610-680]).

The thesis should be 80 to 160 pages in length, and stylistically it should conform to Turabian. Three years from the time it is begun are to be allowed for the completion of the thesis, though, in case of extenuating circumstances, the time allotment can be extended. Three copies of the thesis are required, and approval is by the director and two readers chosen by the director.

An oral comprehensive examination in the field of the thesis is taken concurrently with an oral examination on the major area chosen by the student. These oral examinations are taken after the student has successfully passed a written examination in the minor field.

### **Option B**

Thirty-three semester hours of acceptable course work are required, including three semester hours for the research seminar (HST 601) and at least nine semester hours earned in other 600-level courses (one of which must be a graduate seminar [HST 610-680]). The student does not write a thesis. Written and oral examinations in the major and minor areas chosen by the student are taken after the completion of all required course work.

## **COURSES OF INSTRUCTION**

For the convenience of teachers and other employed persons, courses will be offered in the late afternoon and evening hours except during the third term, second session, when they will be offered primarily in the morning hours.

Courses numbered in the 500s appear also in the undergraduate Bulletin. Enrollment is open to both graduate students and advanced undergraduate students. See the Department's "Graduate History Information Sheet" for methods used to evaluate graduate work in such double-numbered courses. Only double-numbered courses given in the evening have a high proportion of graduate students. Courses numbered in the 600s are restricted to graduate students. The particular emphasis of 600-level courses will be announced each term in the "History Course Descriptions" bulletin found in the History Department's office. These courses may be repeated for graduate credit when

topics and content change. HST 601 (Graduate Research Seminar) is required of all students.

**HST 502. MAIN CURRENTS IN ANCIENT HISTORY:** Aspects of the civilizations of ancient Near Eastern countries, Greece, and Rome selected because of their integration into Western civilization. Emphasized topics: Hebrew world view and value system, Greek democracy, Roman political and social institutions. *3 sem. hrs.*

**HST 505. MEDIEVAL EUROPE:** The development of European history from the 4th to the 14th century: birth of the Middle Ages; development of Christianity; Byzantine, Islamic, and Carolingian Empires; feudalism; Crusades; rise of universities; birth of national cultures. *3 sem. hrs.*

**HST 507. RENAISSANCE AND REFORMATION:** The development of European history from the 14th century to the middle of the 17th. Emphasis on the economic, political, social, and religious aspects of the Renaissance, Protestant Revolution, and Catholic Reformation. *3 sem. hrs.*

**HST 511. ERA OF ABSOLUTISM, ENLIGHTENMENT:** Intellectual and cultural developments between the later Reformation and the era of the French Revolution, with emphasis on political, economic, and social trends of the Old Regime. *3 sem. hrs.*

**HST 512. FRENCH REVOLUTION AND NAPOLEON:** Ideological, economic, social, and political background of the French Revolution; analysis of the revolutionary governments; the resulting international wars; the rise and fall of Napoleon. *3 sem. hrs.*

**HST 515. SOVIET UNION SINCE 1917:** A detailed survey and analysis of the U.S.S.R. from the Revolution of 1917 to the present. *3 sem. hrs.*

**HST 516. EUROPEAN MILITARY HISTORY:** Survey of warfare on the European continent from classical Greece through World War II emphasizing the military's role in society, military institutions, organizations, weapons, and campaigns. *3 sem. hrs.*

**HST 517. AMERICAN MILITARY HISTORY:** Survey of American military affairs from early settlement through Vietnam. Military, naval and air campaigns will be examined. *3 sem. hrs.*

**HST 519. MODERN FRANCE:** French history from the Bourbon Restoration to the present, emphasizing political, socio-economic, and cultural developments. *3 sem. hrs.*

**HST 520. MODERN ITALY:** Italian history from 1815 to the present stressing national unification, the role of the church, rise of fascism, post-World War II, and contemporary issues and new alignments. *3 sem. hrs.*

**HST 521. MODERN GERMANY:** Study of the development of the German nation from 1848 through the period of unification, Bismarck, William II Weimar, the Third Reich, the post-World War II Germanies, to the present. *3 sem. hrs.*

**HST 523. HISTORY OF LONDON:** Study of the evolution of London from a small Roman town to the world's first industrial metropolis. Particular attention to social and environmental conditions and the life of the people. *3 sem. hrs.*

**HST 524. ENGLISH CONSTITUTIONAL AND LEGAL HISTORY:** Study of the origins and development of common law and parliamentary government in England from the Saxon folkmoot to modern representative government. *3 sem. hrs.*

**HST 526. TUDOR-STUART ENGLAND:** Economics, diplomacy, society, and culture in England from 1485 to 1714. For the Tudor period, emphasis on the development of the national state, royal absolutism, and the Reformation; for the Stuart period and Cromwellian Interregnum, the evolution of the constitutional question. *3 sem. hrs.*

**HST 528. MODERN ENGLAND — 1815 TO PRESENT:** The development of England as an industrialized nation as a 19th century empire; the results of industrialization, urbanization, and loss of empire due to two world wars. *3 sem. hrs.*

**HST 538. THE MIDDLE EAST, NINETEENTH AND TWENTIETH CENTURIES:** Survey of the Ottoman Empire, Iran, Egypt, and the modern states of the Middle East in international politics. *3 sem. hrs.*

**HST 540. MODERN CHINA AND JAPAN:** In-depth study of the economic, political, social, cultural, and foreign relations developments of modern China and Japan from the 18th century to the present. *3 sem. hrs.*

**HST 545. KOREAN AND VIETNAM WARS:** In-depth study of the two most important wars fought by the United States after World War II. Examines the wars in the context of America's changing global role and policy since 1945. *3 sem. hrs.*

**HST 550. THE FOUNDING OF AMERICA:** Foundations of American nationality and democratic growth under the British colonial system, with special attention to the economic, political, social and cultural life of the era. *3 sem. hrs.*

**HST 554. THE AGE OF JEFFERSON AND JACKSON:** The range of historical, cultural, social, and political trends traditionally associated with the presidencies of Jefferson and Jackson; the period from the 1790s to the 1850s. *3 sem. hrs.*

**HST 555. THE AMERICAN SOUTH:** Studies the role of the South in American History. *3 sem. hrs.*

**HST 556. CIVIL WAR AND RECONSTRUCTION:** Remote and immediate causes of the Civil War, especially from 1850 to 1861: problems of North and South during the war; consequences of the war, efforts to create a new Union, 1865-1877; problems resulting from those efforts. *3 sem. hrs.*

**HST 557. CONTEMPORARY LATIN AMERICA:** A survey of modern trends in Latin America from the late 19th century to the present with a special emphasis on United States-Latin American relationships. *3 sem. hrs.*

**HST 560. U.S. LEGAL AND CONSTITUTIONAL HISTORY I:** From colonial beginnings through Reconstruction. The first semester of a year's sequence that analyzes the major developments in American legal and constitutional thought and institutions. Emphasis on the evolution of the U.S. Constitution, constitutional theory and practice, and the legal profession. *3 sem. hrs.*

**HST 561. U.S. LEGAL AND CONSTITUTIONAL HISTORY II:** From the Gilded Age to the present. Continuation of HST 560. Prerequisite: HST 560. *3 sem. hrs.*



HST 565. HISTORY OF AMERICAN BUSINESS: Historical study of the evolution of modern capitalism from the colonial period to the present. 3 sem. hrs.

HST 566. SCIENCE, TECHNOLOGY, AND THE MODERN CORPORATION: Historical study of the emergence of twentieth century science-based industry. 3 sem. hrs.

HST 570. HISTORY OF THE COLD WAR: A study of the origins and development of the Cold War from the 1940s to the present. 3 sem. hrs.

HST 572. SOUTHERN APPALACHIA: A study and appraisal of the internal and external historical forces that have shaped the Southern Appalachian region. 3 sem. hrs.

HST 573. THE AGE OF EXCESS AND REFORM: U.S., 1877-1920: Analysis of the development of the United States as an urban-industrial nation and world power and efforts to maintain traditional political, social, and economic forms and values amidst rapid change. 3 sem. hrs.

HST 576. BETWEEN THE WARS: Intensive study of United States History from 1919 to 1941, emphasizing Normalcy, the Depression, the evolving New Deal, and the approach to World War II. 3 sem. hrs.

HST 577. CONTEMPORARY AMERICAN HISTORY: Diplomatic and domestic history of the United States since the beginning of World War II, including the War, wartime conference diplomacy, Russia and the Cold War, cultural trends of mid-century, social equality, and the politics of protest. 3 sem. hrs.

HST 580. HISTORY OF AMERICAN DIPLOMACY: An analytical study of America's foreign relations from the founding of the Republic through the "imperial period" to the Cold War. 3 sem. hrs.

HST 582. HISTORY OF MEXICO: Mexico since 1820, with emphasis on the revolution of 1910 and the struggle for democracy. Consideration of diplomatic and cultural relations between Mexico and the U.S. 3 sem. hrs.

HST 584. CARIBBEAN SINCE 1801: The cultural, social, economic, and political history of the islands and the northern shore of South America in modern times, stressing areas that have gained independence or autonomy. 3 sem. hrs.

HST 590. STRATEGIES OF HISTORIANS: Seminar investigating the various intellectual processes by which historians have approached particular historical questions. A wide sampling of the works of representative historians is supplemented by analyses of their methodologies and philosophies of history. 3 sem. hrs.

HST 600. HISTORIOGRAPHY: A study of the principal historians and the chief contributions to the development of historical writing. Some familiarity with historical method required in research papers. 3 sem. hrs.

HST 601. GRADUATE RESEARCH SEMINAR: Investigation and synthesis of primary research materials in the student's field of concentration. The seminar is unified around methodological solutions to problems in research and writing. Required of all students. 3 sem. hrs.

HST 610. STUDIES IN EARLY EUROPEAN HISTORY	3 sem. hrs.
HST 620. STUDIES IN MODERN EUROPEAN HISTORY	3 sem. hrs.
HST 631. STUDIES IN AFRICAN HISTORY	3 sem. hrs.
HST 632. STUDIES IN MIDDLE EASTERN HISTORY	3 sem. hrs.
HST 640. STUDIES IN ASIAN HISTORY	3 sem. hrs.
HST 660. STUDIES IN U.S. HISTORY	3 sem. hrs.
HST 665. STUDIES IN COMPARATIVE HISTORY	3 sem. hrs.
HST 680. STUDIES IN LATIN AMERICAN HISTORY	3 sem. hrs.
HST 696. SPECIAL STUDIES: Tutorial readings or research in special fields. By permission of chairperson only.	1-3 sem. hrs.
HST 699. THESIS	3-6 sem. hrs.



*President Ford at U.D.*

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## Department of **MATHEMATICS (MTH)**

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John W. McCloskey, Chairperson of the Department

Graduate study in the Department of Mathematics offers students the opportunity to acquire skills in areas normally pursued after the completion of the bachelor's degree. Three different programs leading to the following degrees are available:

- **Master of Science in Mathematics**, with emphasis on various applications or pure Mathematics.
- **Master of Science in Applied Mathematical Systems**. This is an interdisciplinary program administered by the Department of Mathematics; it includes components from Computer Science and Engineering in addition to a concentration in applied Mathematics.
- **Master of Science in Teaching (MST)** with a concentration in Mathematics. See also Joint Programs under School of Education.

### **ASSISTANTSHIPS**

Financial assistance is available to qualified students in the form of graduate teaching assistantships. A graduate teaching assistant receives a stipend plus tuition remission and normally assists a professor in a basic calculus course. Most graduate assistants require two years to complete the work for a master's degree.

### **MASTER OF SCIENCE — MATHEMATICS**

The primary goal of the program is to develop the student's knowledge of mathematical principles and methods to serve as a basis for a professional career or as a foundation for additional studies at the doctoral level.

### **ADMISSION REQUIREMENTS**

In addition to satisfying the general admission requirements of the graduate school, an applicant must have had courses or be able to demonstrate equivalent knowledge in the following areas:

MTH 302 Linear Algebra and Matrices

MTH 361 Introduction to Abstract Algebra

MTH 430 Analysis

A student with deficiencies in these areas may be admitted into the program on the condition that these deficiencies are removed during the first year of graduate study.

### **PROGRAM REQUIREMENTS**

Thirty semester hours are required. These may include (a) a maximum of six semester hours of approved 400-level mathematics courses, (b) a maximum of six semester hours of approved courses outside the department, and (c) a maximum of six semester hours for a thesis in special cases.

In this program, a student must successfully pass written examinations covering the content of three areas of study by his committee, as well as an oral examination within three months of the expected date of graduation.

## MASTER OF SCIENCE — APPLIED MATHEMATICAL SYSTEMS

The primary objective of this program is to train students to do professional work in the applications of mathematics. The program strives to provide both a background in mathematics and an ability to relate mathematics to problems encountered in applications. Students will have the opportunity to gain experience in mathematical modeling techniques and to work on a semester or year-long project.

### ADMISSION REQUIREMENTS

Applicants should have a bachelor's degree in some technical area such as engineering, computer science, physics, or mathematics and have at least a 2.8 average on a 4.0 scale. Applicants should have been ranked in the upper 50% on the GRE. Individuals not having these qualifications may be admitted on a conditional basis if there are sufficient reasons to believe that the student will succeed in the program.

Prerequisites include basic undergraduate skills in mathematics and computer science. In particular a student should have taken an undergraduate calculus sequence (MTH 118, 119, 218) and a course in elementary differential equations (MTH 219). An understanding of the properties of matrices (MTH 302) and some experience with the basic procedures of statistics (MTH 367) is expected. The student should have a working knowledge of an advanced programming language such as FORTRAN or PL/I and have some experience with numerical analysis (CPS 353). Any individual deficient in some prerequisite area would be permitted to take courses to resolve this deficiency during the first year of study in the Applied Mathematical Systems program.

### PROGRAM REQUIREMENTS

The program consists of 30 hours of course work plus at least 3 hours devoted to a research project in the Mathematics Clinic (MTH 541). At least 15 hours of these courses should be taken from the offerings of the Mathematics Department. At most 6 hours of approved 400-level courses may be part of the student's program. The core areas required of all students in the program are as follows:

#### *Semester Hours*

- |   |     |
|---|-----|
| 1) Real and Complex Analysis - MTH 430, 521,<br>or 573 and MTH 431 or 525 ..... | 6   |
| 2) Numerical Analysis - CPS 555 or 556 .....                                    | 3   |
| 3) Differential Equations - MTH 531 or 535 .....                                | 3   |
| 4) Linear Algebra - MTH 565 .....   | 3   |
| 5) Mathematical Modeling - MTH 540 .....  | 3   |
| 6) Mathematics Clinic (Project) - MTH 541 .....                                 | 3-6 |

An individualized degree program should consist of courses taken from the six core areas plus electives approved by the student's committee and the program director. These electives should satisfy the specific needs and interests of the individual student and may include courses in related areas such as computer science, physics, electrical or mechanical engineering, and management science. Any core course which is already part of the student's academic background may be replaced with an elective consistent with the other requirements of the program.

There are three major options available for expansion on the core areas. These options and their course requirements are:

- I. Differential Systems. Advanced and Partial Differential Equations (MTH 531 and MTH 535) plus 6 additional hours of mathematics courses approved by the committee.
- II. Engineering Systems. Continuum Mechanics and Theory of Elasticity (MEE 503 and MEE 533) plus 6 additional hours of engineering courses (of a mathematical nature) approved by the committee.
- III. Computational Systems. Numerical Analysis (CPS 555 and CPS 556) plus 6 additional hours of computer science courses approved by the committee.

## MASTER OF SCIENCE IN TEACHING

The Master of Science degree in Teaching is offered in conjunction with and conferred by the School of Education. A graduate student in mathematics seeking the MST degree should satisfy the same admission requirements as the Master of Science in Mathematics. The program then requires 18 hours of mathematics courses approved by the department plus specific education courses designed to satisfy state requirements. No written examination is required for this degree.

## COMPUTING FACILITIES

Several departmental microcomputers and the university's mainframe computer are available for student use in conjunction with projects and/or course work.

## COURSES OF INSTRUCTION

MTH 519-520. STATISTICAL INFERENCE: Sample spaces, Borel fields, random variables, distribution theory, characteristic functions, exponential families, minimax and Bayes' procedures, sufficiency, efficiency, Rao-Blackwell theorem, Neyman-Pearson lemma, uniformly most powerful tests, multi-variate normal distributions.

*3 sem. hrs. each.*

MTH 521-522. REAL VARIABLES: The topology of the real line, continuity and differentiability, Riemann and Stieltjes integrals, Lebesgue measure and Lebesgue integral. Measure and integration over abstract spaces,  $L_p$ -spaces, signed measures, Jordan-Hahn decomposition, Radon-Nikodym theorem, Riesz representation theorem, and Fourier series.

*3 sem. hrs. each.*

**MTH 525. COMPLEX VARIABLES I:** Analytic functions, integration on paths, the general Cauchy theorem. Singularities, residues, inverse functions and other applications of the Cauchy theory. *3 sem. hrs.*

**MTH 526. COMPLEX VARIABLES II:** Infinite products, entire functions, the Riemann mapping theorem and other topics as time permits. Prerequisite: MTH 525 or equivalent. *3 sem. hrs.*

**MTH 531. ADVANCED DIFFERENTIAL EQUATIONS:** Existence and uniqueness theorems, linear equations and systems, self-adjoint systems, boundary value problems and basic nonlinear techniques. Prerequisite: MTH 403 or equivalent. *3 sem. hrs.*

**MTH 535. PARTIAL DIFFERENTIAL EQUATIONS:** Classification of partial differential equations; methods of solution for the wave equation, Laplace's equation, and the heat equation; applications. Prerequisite: MTH 403 or equivalent. *3 sem. hrs.*

**MTH 540. MATHEMATICAL MODELING:** An introduction to the use of mathematical techniques and results in constructing and modifying models designed to describe and/or predict behavior of real world situations. Prerequisite: permission of the instructor. *3 sem. hrs.*

**MTH 541. MATHEMATICS CLINIC:** Student teams will be responsible for the development or modification and testing of a mathematical model designed for a particular purpose. Faculty guidance will be provided. May be repeated once for a maximum of 6 credit hours. Prerequisite: permission of the chairperson. *3 sem. hrs.*

**MTH 543. LINEAR MODELS:** Least square techniques, lack of fit and pure error, correlation, matrix methods, F test, weighted least squares, examination of residuals, multiple regression, transformations and dummy variables, model building, ridge regression, stepwise regression, multiple regression applied to analysis of variance problems. Prerequisite: MTH 368 or equivalent. *3 sem. hrs.*

**MTH 545. SPECIAL FUNCTIONS:** The special functions arising from solutions of boundary value problems which are encountered in engineering and the physical sciences. Hypergeometric functions, Bessel functions, Legendre polynomials. Prerequisite: MTH 403 or equivalent. *3 sem. hrs.*

**MTH 547. STATISTICS FOR EXPERIMENTERS:** Covers those areas of design of experiments and analysis of quantitative data that are useful to anyone engaged in experimental work. Designed experiments using replication and blocking. Use of transformations. Applications of full and fractional factorial designs. Experimental design for developing quality into products using Taguchi methods. Prerequisites: MTH 367 or equivalent. *3 sem. hrs.*

**MTH 551. METHODS OF MATHEMATICAL PHYSICS:** Linear transformations and matrix theory, linear integral equations, calculus of variations, eigenvalue problems. Prerequisite: MTH 403 or equivalent. *3 sem. hrs.*

**MTH 555-556. NUMERICAL ANALYSIS:** Quadrature methods, the numerical solution of ordinary and partial differential equations, matrices and large scale systems, modern iterative matrix methods, minimax approximation, orthogonal functions, and data smoothing. Prerequisites: CPS 144 or 150, MTH 302 or equivalent, and MTH 319. *3 sem. hrs. each.*

**MTH 561. MODERN ALGEBRA I:** Groups, rings, integral domains and fields; extensions of rings and fields; polynomial rings and factorization theory in integral domains; modules and ideals. 3 sem. hrs.

**MTH 562. MODERN ALGEBRA II:** Finite and infinite field extensions, algebraic closure, constructible numbers and solvability by use of radicals, Galois theory, and selected advanced topics. Prerequisite: MTH 561. 3 sem. hrs.

**MTH 565. LINEAR ALGEBRA:** Vector spaces, linear transformations and matrices; determinants, inner product spaces, invariant direct-sum decomposition and the Jordan canonical form. 3 sem. hrs.

**MTH 571. TOPOLOGY I:** An axiomatic treatment of the concept of a topological space; bases and subbases; connectedness, compactness; continuity, homeomorphisms, separation axioms and countability axioms; convergence in topological spaces. 3 sem. hrs.

**MTH 572. TOPOLOGY II:** Compactification theory, paracompactness and metrizability theorems, uniform spaces, function spaces, and other advanced topics of current interest. Prerequisite: MTH 571 or equivalent. 3 sem. hrs.

**MTH 573. FUNCTIONAL ANALYSIS:** The study of linear metric spaces with emphasis on Banach and Hilbert spaces. The Hahn-Banach theorem, the Banach fixed point theorem, and their consequences. Approximations and other selected advanced topics. 3 sem. hrs.

**MTH 575. DIFFERENTIAL GEOMETRY:** Vector and tensor algebra; covariant differentiation. An introduction to the classical theory of curves and surfaces treated by means of vector and tensor analysis. 3 sem. hrs.

**MTH 590. TOPICS IN MATHEMATICS:** This course, given upon appropriate occasions, deals with specialized material not covered in the regular courses. May be taken more than once as topics change. Prerequisite: consent of advisor. 3 sem. hrs. each term.

**MTH 598. THESIS** 3-6 sem. hrs.

## SPECIAL TOPICS:

*In addition to the above courses, the department offers a sequence of one-semester-hour courses on specialized topics to service the graduate programs in the School of Engineering. These are generally offered only during the Third term.*

**MTH 581. FOURIER TRANSFORMS AND CONVOLUTION:** Fourier integral theorem; graphical interpretations; properties of Fourier transforms; application to partial differential equations, properties of convolution; the convolution theorem, and Rayleigh's theorem; numerical and graphical convolution. Prerequisite: permission of the instructor. Third term each year. 1 sem. hr.

**MTH 582. OPERATIONAL CALCULUS:** Generalized functions and their differentiation properties; the Dirac (Delta) -functions and its relatives; Fourier transforms and convolution of generalized functions. Prerequisite: MTH 581. Third term each year. 1 sem. hr.

**MTH 583. TENSOR ANALYSIS:** Introduction to elementary tensors in cartesian, oblique, and generalized coordinates. Differentiation of tensor fields. The general form of gradient, divergence, and curl. Third term each year. *1 sem. hr.*

**MTH 584. NONLINEAR OSCILLATIONS:** Phase trajectories of linear and nonlinear conservative systems, nonlinear oscillatory systems, and the theory of first approximations. *1 sem. hr.*

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## Department of **PHILOSOPHY (PHL)**

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Lawrence P. Ulrich, Chairperson of the Department

The graduate program in philosophy leading to the Master of Arts provides the conditions for cooperative study and research enabling a student to acquire a more comprehensive knowledge and understanding of major philosophical positions in both the history of philosophy and in contemporary philosophy and develop abilities for critical philosophical reflection.

Some of the students earning this degree have gone on to do doctoral work in philosophy and other academic areas. Some have gone on to teach philosophy at four-year and two-year colleges. Still others have pursued the program out of a general interest in advanced philosophical studies or in conjunction with further professional studies.

A distinctive feature of the graduate program in philosophy is the emphasis on the continuity of philosophic inquiry from the ancient and the medieval eras to the modern and contemporary periods. Each graduate student arranges a program in consultation with the chairperson of the Philosophy Department. A program of study developed in accordance with student objectives normally calls for exposure to areas beyond those of immediate interest to the student.

## **ASSISTANTSHIPS**

Graduate teaching assistantships are available for the first and second years of study. These offer tuition and fee remissions. Residence hall counselorships, which include stipends as well as tuition and fee remission are also available for qualified students.

### **Teaching Apprenticeship**

All graduate teaching assistants participate in a two-year apprenticeship program. In the first year, students work closely with a faculty member in the teaching of the introductory course in philosophy and participate in monthly seminars on pedagogical problems and solutions encountered



at this level. In the second year, students who successfully complete their first-year apprenticeship are eligible to teach the introductory course under supervision in both semesters. Teaching assistants sign up each semester for one hour credit in PHL 698 *Teaching Apprenticeship in Philosophy*. These credits do not reduce the 30 semester hours of course work required for the degree.

## **ADMISSION REQUIREMENTS**

Students working toward the Master of Arts in Philosophy are subject to the general graduate policies and requirements of the University and the College of Arts and Sciences. In addition, the following departmental requirements hold: a formal statement of a student's objectives in taking the philosophy program is requested along with the application. For admission to regular status, a student must have had at least 24 semester hours in undergraduate philosophy courses or have equivalent competence. Otherwise, the student can apply for conditional or unclassified status.

## **PROGRAM REQUIREMENTS**

Students pursuing the Master of Arts need a minimum of 30 semester hours of satisfactory graduate work. Six of these may be given for a satisfactory thesis (if the thesis option is chosen), or six may be given for satisfactory graduate or professional course work in non-philosophy subjects.

### **Readings Examination**

Students pursuing the Master of Arts degree must show competency in understanding prime source material of major philosophers in the history of philosophy. This is evidenced by passing an oral examination based on the reading list available through the department. Authors include Plato, Aristotle and Aquinas or Anselm for the ancient and medieval period, and Descartes, Hume and Kant for the modern period.

## **PROGRAM OPTIONS**

Students working toward the Master of the Arts with a major in philosophy have the following options available to them:

### **Thesis**

Students may choose to write a research thesis in view of their personal and professional objectives. For further information consult the chairperson.

### **Language Examination**

Students wishing to continue their philosophic studies are strongly urged to learn at least one or two foreign languages to improve their professional skills in philosophy. Language examinations may be arranged through the chairperson of the Philosophy Department. If they are passed, the results will be noted on the student's official records; but no graduate

credit is awarded for passing a language examination. Satisfactory completion is shown by the grade CR (credit) on the transcript. These credits do not reduce the 30 semester hours of course work required for the degree.

## JOINT M.A. IN PHILOSOPHY - J.D. IN LAW

The department also affords opportunities to qualified Law students to pursue the Master of Arts Degree in Philosophy jointly with the Juris Doctor at the University of Dayton Law School. For additional information, consult the chairperson of the Philosophy Department.

## COURSES OF INSTRUCTION

The department regularly reviews its curriculum and cycles its courses to help meet the needs of its students and fulfill program objectives. The curriculum consists of courses utilizing classic and contemporary primary texts in four areas to promote breadth at the master's degree level:

**Continuity of Western Philosophic Problems**  
**Diversity of Worldwide Philosophic Styles and Methods**  
**Persons and Knowledge**  
**Persons and Values**

A Course Registration Guide is regularly published in advance of registration with notice on course objectives, context, texts, methods of instruction, and methods of evaluation for the course. Graduate classes normally meet in the late afternoon and early evening hours during the fall and winter semesters. In the summer semester, courses may be arranged through the chairperson.

## CONTINUITY OF WESTERN PHILOSOPHIC PROBLEMS

PHL 601. PHILOSOPHY OF PLATO: A detailed analysis of some of Plato's major dialogues such as the *Meno*, *Theaetetus*, *Sophist*, *Paramenides*, and *Timaeus*.

3 sem. hrs.

PHL 602. PHILOSOPHY OF ARISTOTLE: A study of some of the major metaphysical, logical, epistemological, moral, and political issues discussed in Aristotle's texts.

3 sem. hrs.

PHL 603. MEDIEVAL STUDIES: A study of the writings of a particular medieval philosopher and/or a particular problem in medieval philosophy.

3 sem. hrs.

PHL 604. PHILOSOPHY OF AQUINAS: A study of the moral, social, political, legal, religious, epistemological, and metaphysical issues raised by St. Thomas in his own writings, as developed in those of his commentators, and as they bear on problems in recent philosophy.

3 sem. hrs.

PHL 605. PHILOSOPHY OF DESCARTES: A critical examination of Descartes' philosophy in his major works in view of the characteristic claims of rationalism.

3 sem. hrs.

PHL 606. PHILOSOPHY OF HUME: A detailed examination of the epistemological, metaphysical, and ethical issues discussed in Hume's major texts and by contemporary commentators. 3 sem. hrs.

PHL 607. PHILOSOPHY OF KANT: An in-depth study of either Kant's theoretical philosophy such as the problem of metaphysics as found in the *Dissertation of 1770*, the *Critique of Pure Reason*, and the *Prolegomena to Any Future Metaphysics*, or his practical philosophy such as the problem of objective ethics as found in the *Critique of Practical Reason* and in the *Foundations of the Metaphysics of Morals*. 3 sem. hrs.

PHL 608. PHILOSOPHY OF HEGEL: A study of *The Phenomenology of Spirit* as an introduction to Hegel's overall philosophy with special attention to important passages such as the master-slave dialect which has influenced subsequent philosophical development. 3 sem. hrs.

## DIVERSITY OF WORLD-WIDE PHILOSOPHIC STYLES AND METHODS

PHL 621. AMERICAN PRAGMATISM: An examination of the major philosophic writings in the American Pragmatic tradition with stress on C. S. Peirce, William James, or John Dewey. 3 sem. hrs.

PHL 622. EXISTENTIALISM: A study of existentialism as an original view of the human person and the lived world by one major existential philosopher such as Sartre or Heidegger. 3 sem. hrs.

PHL 623. MARXIST PHILOSOPHY: An examination of the central concepts developed and analyzed by Karl Marx in his major works. Also studied are some contemporary developments of Marxist thought. 3 sem. hrs.

PHL 624. PHENOMENOLOGY: A study of the origins of phenomenology in the descriptive psychology of Brentano, its development to a form of transcendental idealism by Husserl, and the attempt of Husserl to establish philosophy as a rigorous science by a phenomenological method. The bearing of phenomenology on Heidegger's and Sartre's attempts to develop a phenomenological ontology will also be explored. 3 sem. hrs.

PHL 625. PHILOSOPHY OF LANGUAGE: An in-depth examination of such topics as meaning, naming, referring, and truth with emphasis on contemporary theories and problems in the Anglo-American tradition. 3 sem. hrs.

PHL 626. ORIENTAL PHILOSOPHY: A critical examination of Hindu and Buddhist philosophies with concentration on the ultimate reality, consciousness, and salvation. 3 sem. hrs.

PHL 627. PROCESS PHILOSOPHY: A critical study of Alfred North Whitehead's *Process and Reality* in view of its historical setting, his other works, and the works of such process philosophers as Bergson and Hartshorne. 3 sem. hrs.

**PHL 628. RECENT JUDAIC AND CHRISTIAN PHILOSOPHY:** A examination of current approaches and solutions to the perennial problems of Judaic and Christian philosophy by such thinkers as Alston, Dupre, Grisez, Mavrodes, McInerney, Noonan, Plantinga, Smart, Weiss and others. Topics include: the relation of religious belief to reason; the significance of suffering and of death; moral belief and natural law; immortality and resurrection. *3 sem. hrs.*

## **PERSONS AND KNOWLEDGE**

**PHL 641. ADVANCED LOGIC:** A study of both formalization and interpretation of such concepts as necessity, entailment, consistency, completeness, negation and a wide range of propositional attitudes. *3 sem. hrs.*

**PHL 642. EPISTEMOLOGY:** An examination of recent developments in the theory of knowledge in Anglo-American philosophy, with emphasis on alternative theories of cognitive justification, scepticism, and the "justified true belief analysis" of knowledge. *3 sem. hrs.*

**PHL 643. METAPHYSICS:** A detailed analysis of some central metaphysical concepts such as identity and personal identity, causality and necessity, freedom and determinism. Topics can vary but will include an examination of the concept of metaphysics itself. *3 sem. hrs.*

**PHL 644. PHILOSOPHY OF SCIENCE:** An examination of selected methodological issues in either the physical or social sciences, with emphasis on the following: explanation, confirmation, theory and concept formation, observation and the problem of objectivity. *3 sem. hrs.*

## **PERSONS AND VALUES**

**PHL 651. PHILOSOPHY OF THE PERSON:** An investigation into the nature of human beings as described in those contemporary models that do not exclusively concentrate on the cognitive abilities or features of the human being. Such issues as freedom, motivation, action, consciousness, intentionality, and interpersonal relations will be examined philosophically. *3 sem. hrs.*

**PHL 652. ETHICS:** A critical review and evaluation of ethical and metaethical theories since G. E. Moore. *3 sem. hrs.*

**PHL 653. AESTHETICS:** A critical examination of important concepts as well as problems and theories in the philosophy of art. *3 sem. hrs.*

**PHL 654. PHILOSOPHY OF RELIGION:** A study of the nature of religion and a critical evaluation of the issues related to religious language and the concept and existence of God. *3 sem. hrs.*

**PHL 655. SOCIAL AND POLITICAL PHILOSOPHY:** A critical philosophic examination of major social and political philosophies as well as the central concepts in social and political philosophy. *3 sem. hrs.*

**PHL 656. PHILOSOPHY OF LAW:** A study of legal norms and values in legal reasoning with clarification of core concepts of a legal system such as responsibility, defenses, fault, and equity and of the major styles of legal theory such as natural law and positive law. Different patterns of legal decision-making, e.g., criminal, civil, and constitutional will be stressed. *3 sem. hrs.*

PHL 657. MORALITY, SOCIAL ETHICS, AND LAW: A philosophic study of certain important moral, social, and religious values such as equality, order, liberty, life, property, rights, justice, respect, and charity especially in the context of legislative, judicial, and interinstitutional decision-making. *3 sem. hrs.*

PHL 658. ETHICS IN CLINICAL ASSESSMENT AND PSYCHOTHERAPY: An examination of the conceptual structures, the derivation of ethical principles and their application in the general framework of client assessment and the practice of psychotherapy. Discussion includes evaluating ethical codes, assessment practices, the techniques of psychotherapy and significant problems arising in clinical practice. *3 sem. hrs.*

PHL 659. ETHICAL THEORIES AND NUCLEAR WAREFARE: A contrast of realism, contractarianism, utilitarianism, Marxism, just-war doctrine, and pacificism as applied to nuclear war, limited nuclear war, deterrence, feasible alternatives, and related issues. *3 sem. hrs.*

### **SPECIAL COURSES**

PHL 690. SEMINAR: Topics, authors, and/or problems in philosophy selected by the professor. *3 sem. hrs.*

PHL 695. DIRECTED STUDIES: To augment the graduate student's previous training or to allow advanced study on a particular problem, philosopher, or historical era. Arrange through the chairperson. *3 sem. hrs.*

PHL 698. TEACHING APPRENTICESHIP IN PHILOSOPHY: Participation each term as a teaching apprentice to faculty and in the direct teaching of lower-level undergraduate philosophy courses. Required of and open only to graduate philosophy assistants. *1 sem. hr.*

PHL. 699 THESIS *3-6 sem hrs.*

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## **Department of PHYSICS (PHY)**

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J. Michael O'Hare, Chairperson of the Department

The Master of Science program in the Department of Physics seeks to provide the student with the thorough understanding and appreciation of the discipline. Advanced study in Physics may be used to develop competence for involvement in research and development programs in industry and government, to enrich the background for teaching Physics on the junior college or secondary school level, or to prepare for advanced degree (Ph.D.) academic programs.

### **ADMISSION REQUIREMENTS**

Applicants will be admitted to advanced study in Physics if the graduate

admission committee of the department determines that they are qualified for the degree program. A series of examinations covering basic Physics subjects on the intermediate level are available to candidates entering the program. These assist the student and the Department to choose the courses appropriate to the student's needs. The applicant will be required to make up any deficiencies which the department deems necessary to attain the level of the graduate course. In general, a properly prepared student should have the following background:

1. Physics courses which are approximately the equivalent of the following University of Dayton courses:
  - PHY 303 Intermediate Mechanics
  - PHY 408 Intermediate Electricity and Magnetism
  - PHY 301 Thermodynamics
  - PHY 390 Introduction to Quantum Mechanics
2. Mathematics through differential equations and preferably advanced calculus.
3. Additional upper-level undergraduate Physics courses relating to the area of the student's interest, such as electronics, optics, solid state, or atomic and nuclear physics.

## ASSISTANTSHIPS

A limited number of graduate assistantships are available. These generally carry a stipend and tuition remission for the course required for the degree. Recipients are expected to complete the requirements for the Master's degree in two years. Students in the Electro-Optical Science may also apply for assistantships in the Department of Physics. Detailed information and forms for making application may be obtained from the chairperson or director of the proposed program.

## PROGRAM REQUIREMENTS

The formal requirement for the degree is 30 semester hours of course work properly distributed. Eighteen of these must be graduate Physics courses. No foreign language competency is necessary for the Master of Science with a major in Physics. Each program, tailored to the student's own interest and career plans, is determined after consultation between the student and the advisory committee in accord with the following guidelines:

- A core sequence is required of all degree students:

	<i>Semester Hours</i>
PHY 511 Classical Mechanics .....	3
PHY 515 Statistical Mechanics .....	3
PHY 523 Electromagnetic Theory I .....	3
PHY 525 Quantum Mechanics I .....	3

- An area of concentration is accomplished through special topic courses and involvement in the current research activities of the faculty and staff of the Department of Physics. These activities include experimental and theoretical

solid state physics with emphasis on optical, electrical, and magnetic properties of material, laser interactions with material, semiconductors, optical spectroscopy, surface phenomena, resonance studies, and environmental applications of physics.

- By the end of the first term, students are expected to be sufficiently familiar with computer programming to solve basic problems in physics using the computer. This requirement can be fulfilled on an *ad hoc* basis or by taking a formal programming course.
- Courses in such related disciplines as Mathematics, Chemistry, and Engineering may be chosen up to a maximum of 12 semester hours with the approval of the chairperson of the department.
- A maximum of six semester hours of graduate credit may be granted for advanced undergraduate courses (300-400 level) with the approval of the graduate committee of the department.

**NOTE:** *Courses for which undergraduate credit has been allowed may not be repeated for graduate credit.*

- The Master's thesis is recommended for those students who have no comparable experience. An oral examination before a committee designated by the chairperson of the department must be passed before credit can be given. A maximum of six semester hours toward a degree can be given for thesis work.

## COURSES OF INSTRUCTION

PHY 511. CLASSICAL MECHANICS: Analytical dynamics; variational techniques, Hamilton's Principle: the Lagrangian, the Hamiltonian, Hamilton-Jacobi and Poisson Bracket formulations of mechanics; Galilean and Lorentz invariance; and relativistic dynamics. Prerequisite; PHY 303-403 or equivalent. 3 sem. hrs.

PHY 515. STATISTICAL MECHANICS: Basic assumptions, statistics of independent particles, the Maxwell Boltzman distribution, Fermi-Dirac, Bose-Einstein statistics, applications of distribution laws. 3 sem. hrs.

PHY 518. Topics can include calculation techniques in modern physics, complex variable theory, dispersion relations, linear vector spaces, operators, matrix mechanics, eigenvalue equations. Prerequisites: MTH 403-404 or consent of instructor. 3 sem. hrs.

PHY 519. THEORETICAL PHYSICS II: Topics can include orthogonal functions, Dirac delta function. Laplace's equation, Poisson's equation, D'Alembert's equation, transformation theorems. Green's function, group theory. Prerequisite: PHY 525 or consent of instructor. 3 sem. hrs.

PHY 520. ADVANCED SOLID STATE PHYSICS: Crystal structure, thermal properties of solids; insulators; band theory of solids; semi-conductors; luminescence. Prerequisite: PHY 525 or permission of instructor. 3 sem. hrs.

PHY 523. ADVANCED ELECTRICITY AND MAGNETISM I: The boundary value problems of electrostatics and magnetostatics in material media, conservation laws, existence and nature of electromagnetic radiation derived from Maxwell's equations. 3 sem. hrs.

PHY 524. ADVANCED ELECTRICITY AND MAGNETISM II: Radiating systems, interference and diffraction; wave guides and resonant cavities; Cherenkov radiation, bremsstrahlung, and multipole fields, special applications of electromagnetic theory. Prerequisite: PHY 523. *3 sem. hrs.*

PHY 525. QUANTUM MECHANICS I: The physical basis of quantum mechanics, wave packets, free particle motion: Schrodinger's equation applied to potential problems; harmonic oscillator and the hydrogen atom; three-dimensional extrapolation and scattering. *3 sem. hrs.*

PHY 526. QUANTUM MECHANICS II: Linear vector spaces and spin; time dependent and time independent perturbation theory; development of the formal theory of scattering; discussion of the importance of symmetries and rotations. Prerequisite: PHY 525. *3 sem. hrs.*

PHY 540. INTRODUCTION TO POLYMER SCIENCE: An introduction to polymers. A largely nonmathematical survey of the field. Prerequisites: college chemistry and calculus. *3 sem. hrs.*

PHY 541. PHYSICAL PROPERTIES OF POLYMERS: An intensive discussion of the interrelations between molecular and gross physical properties of polymers. Prerequisites: PHY 540 or equivalent, background in differential equations. *3 sem. hrs.*

PHY 590. GRADUATE THESIS: A research problem in a selected topics resulting in a written thesis. *0-6 sem. hrs.*

PHY 595. GRADUATE SEMINAR: Weekly seminars presented by graduate students, faculty, and guest lecturers on current topics. *No credit.*

PHY 599. SPECIAL PROBLEMS IN (NAMED AREA): Lecture, seminar, laboratory, or library work in designated areas of topical interest in Physics. May be taken more than once. *1-3 sem. hrs.*

## ELECTRO-OPTICS PROGRAM

Certain courses in the Electro-Optics programs may be taken for graduate Physics credit. These are:

PHY 599/EOP501. GEOMETRIC OPTICS: Wavefronts and rays; Fermat's principle; Gaussian optics and axially systems; aperture stops; pupils and fields lenses; Lagrange invariant; angular and visual magnification; optical systems; plane mirrors and prisms; aberration theory; introduction to computer ray tracing.

PHY 599/EOP502. OPTICAL RADIATION AND MATTER: Maxwell's equations; electromagnetic waves; interaction of radiation with atomic electrons; molecular and lattice vibration; study of phenomena related to the interaction of optical radiation with matter; polarization; crystal optics; nonlinear dielectric effects.

PHY 510/EOP503. PRINCIPLES OF MODERN OPTICS I: Wave theory; electromagnetic theory; mathematical techniques; Fresnel and Fraunhofer diffraction; coherence; and interference.



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## Department of POLITICAL SCIENCE (POL)

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Gerald E. Kerns, Chairperson of the Department

The Department of Political Science offers three graduate programs; each one is designed to accomplish a particular objective.

- **Master of Arts with a major in Political Science** is primarily an academic degree leading toward increased knowledge of the political process, teaching, or advanced study. For this preparation, the department stresses thorough knowledge of a few of the subareas of political science rather than attempting a superficial acquaintance with all of them.
- **Master of Arts with a major in Political Science and a specific concentration in International Affairs is a special program.** This special program is intended to be a general degree in international affairs for people with interest in government, military service, international business, or for personal satisfaction.
- **Master of Arts in Public Administration** is a professional degree which is designed to prepare students for administrative careers in contemporary society.

### ASSISTANTSHIPS

The department offers two graduate assistantships each year. The graduate assistants perform research and administrative tasks for the faculty. Each assistant receives full tuition remission plus stipend. An assistantship once granted is renewable for a second year.

## MASTER OF ARTS POLITICAL SCIENCE PROGRAM

### ADMISSION REQUIREMENTS

For admission to the program leading to the Master of Arts, the department requires the following:

1. Baccalaureate degree from an accredited college or university.
2. Undergraduate concentration in one of the fields of the social sciences.
3. Sufficient academic preparation and experiences that would indicate student's ability to pursue graduate studies.
4. Candidates who have earned their degrees in a pass-fail grading system must supply the department with their scores in the general section of the GRE.

**NOTE:** If the candidate's concentration has been outside of the social science areas, if deficiencies in academic records are indicated, the department may admit the student **conditionally** or require additional work. Courses considered prerequisite by the department may not later be included within the candidate's graduate program.

## DEGREE REQUIREMENTS

After consultation with the graduate advisor and in accordance with the student's long range academic objectives, a candidate for the Master of Arts must complete the following requirements:

- I. Thirty-six semester hours consisting of 18 semester hours of required courses and 18 semester hours of electives:

### *Semester Hours*

#### **Required Courses** (18 semester hours)

POL 501 Scope and Methods of Political Science .....	3
POL 502 Colloquium in American Politics .....	3
POL 503 Colloquium in Comparative Politics .....	3
POL 514 Development of Political Theory .....	3
POL 590 Research Seminar in Political Science .....	3
POL 597 Research Project .....	3

#### **Electives** (18 Semester Hours)

These must be selected from elective graduate courses in political science, 400-level undergraduate courses in Political Science, and/or graduate courses in cognate fields.

- II. Oral defense of the research paper before the students and the faculty of the department at the completion of 36 semester hours of course work.
- III. Students must achieve a minimum B (3.0) cumulative average in all courses. Their progress will be evaluated at the completion of 12 semester hours of credit. They must have a minimum of B average to obtain the degree.

## CURRICULUM

### **General Courses**

POL 502 Colloquium in American Politics  
 POL 521 Intergovernmental Relations  
 POL 545 Urban Politics and Policy  
 POL 546 Seminar: Public Opinion and Political Behavior  
 POL 557 Seminar: State Government and Politics  
 POL 579 Selected Topics in Public Policy

### **American Political Processes**

POL 501 Scope and Methods of Political Science  
 POL 567 Independent Study in Political Science  
 POL 590 Research Seminar in Political Science  
 POL 597 Research Project

### **Comparative Politics**

POL 503 Colloquium in Comparative Politics  
 POL 520 Seminar in Soviet Politics  
 POL 522 Seminar in Asian Politics  
 POL 529 Seminar in European Politics

POL 569 Seminar in Political Theory: Theory and Practice of Communism  
POL 583 Comparative Public Policy

***Political Theory and Public Law***

POL 514 Development of Political Theory  
POL 569 Seminar: Selected Topics in Political Theory  
POL 571 Seminar: Judicial and Constitutional Politics

## MASTER OF ARTS - CONCENTRATION IN INTERNATIONAL AFFAIRS

### ADMISSION REQUIREMENTS

1. Baccalaureate degree from an accredited college or university.
2. Undergraduate concentration in one of the fields of the social sciences. Candidates without this qualification may still be admitted on a *conditional* basis.
3. Cumulative grade point average of 2.7 or better in a 4.0 grading system, or a combined score of a least 1000 on the verbal and quantitative sections of the Graduate Record Examination. Those candidates with lower cumulative averages or GRE scores may be considered for acceptance on a *conditional* basis. In such cases particular attention will be given to the information contained in the applicant's statement on career objectives and the letters of recommendation.
4. Candidates who have earned their degrees in a pass-fail grading system must submit their scores in the verbal and quantitative sections of the GRE.

### DEGREE REQUIREMENTS

- I. To receive the of Master of Arts degree with a concentration in International Affairs, the student must satisfactorily complete *thirty-six* hours of course work with a cumulative grade point average of 3.0 or better.
  - A. The thirty-six hours of course work must include POL 503 (Colloquium in Comparative Politics), POL 515 (International Relations), POL 590 (Research Seminar), and ECO 510 (International Economics).
  - B. The remainder of the thirty-six hours must consist of courses selected from the M.A.I.A. curriculum which emphasizes the areas of International Relations/Foreign Policy and Comparative Politics/Modernization. No more than *six semester hours* of courses may be taken outside of the M.A.I.A. curriculum (cognate courses) and these courses must be approved by the department. Students can take up to *six hours* of courses at the 400-level but such courses must be approved by the department.

- II. At the completion of 12 semester hours of credit, the academic progress of the student will be evaluated by a committee of departmental faculty. It is *incumbent* upon the student after the completion of 12 semester hours of credit to *initiate* the petition for review with the chairperson of the M.A.I.A. Committee.

## Curriculum

### ***General courses:***

- POL 567 Independent Study
- POL 590 Research Seminar

### ***International Relations/Foreign Policy courses:***

- POL 509 Soviet Foreign Policy
- POL 515 International Relations
- POL 516 Comparative Foreign Policy Analysis
- POL 517 American Foreign Policy
- POL 518 U.S. National Security Policy
- POL 519 Chinese Foreign Policy
- POL 406 International Law and Organization
- POL 510 International Economics

### ***Comparative Politics/Modernization courses:***

- POL 503 Colloquium in Comparative Politics
- POL 520 Soviet Politics
- POL 522 Seminar in Asian Politics
- POL 523 Latin American Politics
- POL 525 Politics in the Middle East
- POL 529 Seminar in European Politics
- POL 530 Seminar: Chinese Politics
- POL 531 Seminar: Japanese Politics
- POL 554 Comparative Development Administration
- POL 583 Comparative Public Policy
- POL 569 Seminar in Political Theory — Theory and Practice of Communism
- POL 457 Political Change in the Third World

### ***Cognate courses:***

- HST 540 Modern China and Japan
- HST 549 The Cold War
- HST 557 Contemporary Latin America
- HST 580 American Diplomatic History

## MASTER OF PUBLIC ADMINISTRATION

Peter B. Nelson, Director of the Program

### ADMISSION REQUIREMENTS

1. Baccalaureate degree from an accredited college or university.
2. Cumulative grade point average of 2.7 in a 4.0 grading system, or a combined score of at least 1000 on the verbal and quantitative sections of the Graduate Record Examination. Those with lower averages and GRE scores may be considered for acceptance on a conditional basis. In such cases particular attention will be given to the information requested in admissions requirements 4 and 5.
3. Students applying from schools operating on a pass-fail grading system are required to submit scores from the verbal and quantitative sections of the GRE. Other applicants are encouraged to submit GRE scores as additional evidence of their competence to do graduate work.
4. The following will also be considered:
  - (a) At least three letters of recommendation from individuals in a position to judge the applicant's capacity for graduate work. Persons who have graduated from college within the past five years are requested to submit at least one letter from a former professor.
  - (b) The applicant's work experience and statement of career objectives.
  - (c) The applicant's undergraduate academic preparation and achievements in disciplines related to the public service.
5. An applicant may be required to submit additional information when the departmental graduate committee feels that such information is necessary.

### DEGREE REQUIREMENTS

- I. To receive the Master of Public Administration degree, the student must satisfactorily complete thirty-six semester hours of course work with a cumulative grade point average of 3.0 or better.
  - A. The thirty-six hours of course work must include POL 510, POL 581, POL 511, and at least one course under the heading Environment of Public Administration. The required courses may be waived for students with appropriate academic backgrounds.
  - B. The remainder of the thirty-six hours must consist of courses selected from the M.P.A. curriculum. Exceptions will be made by the program director in case the student's interests and career objectives make other courses particularly useful. No more than six semester hours of courses outside the M.P.A. curriculum may be taken at the 400 level.
- II. Within the general requirements in A and B above, the student may select one of three options:
  - A. The student may take 3 to 6 semester hours of academic courses and 3 to 6 hours of POL 595, Internship. A student taking this option is encouraged to begin the internship only after completing 18 credit hours of other courses and successfully passing the Certifying Examination.

B. The student under certain conditions may take 30 to 33 hours of academic course work and 3 to 6 hours of POL 596, Public Service Project. This option is available only to students employed in administrative positions in public or quasi-public agencies other than internship positions. Students are encouraged to enroll in POL 596 only after completing 18 hours of other courses, and successfully passing the Certifying Examination.

C. The student may take the full 36 semester hours in regular academic courses.

Students selecting this option are encouraged to complete at least three hours of POL 578, Independent Study in Public Administration.

III. Upon the completion of 18 semester hours of course work, excluding credit hours transferred from other schools or programs, each student must apply to the director of the M.P.A. Program for a written certifying examination.

The examination committee will explore each student's (1) performance in the program to date, (2) strengths and weaknesses in mastering the discipline of Public Administration, and (3) potential for a career in the public service.

During the course of the examination, the following characteristics of the student will be evaluated specifically:

A. Knowledge of factual matter important for a career in public administration.

B. Skills in interpersonal relationships, problem analysis, and oral and written communication.

C. Ability to deal with key concepts and to interrelate subject matters.

The examination committee will consist of faculty members from the University of Dayton. The committee will take one of three actions:

A. Certify the student for further course work without restriction.

B. Certify the student for further coursework with restrictions.

C. Require that the student be re-examined. No more than one re-examination per student may be given. Failure to pass the re-examination will result in removal from the program.

## **Curriculum**

### ***Administration and Management***

POL 510 Public Administration

POL 535 Fiscal Administration

POL 576 Public Personnel Administration

POL 577 Public Sector Labor Management Relations

POL 595 Government Internship

POL 596 Public Service Project

POL 544 Managing for "Smaller"

### ***Analytic Tools and Policy Analysis***

POL 511 Quantitative Methods in Public Administration I

POL 512 Quantitative Methods in Public Administration II

POL 579 Selected Topics in Public Policy

POL 584 Introduction to Public Policy

POL 552 Government Planning

***Internal/Group/and Organizational Dynamics  
of Public Administration***

POL 581 Organization Theory

POL 505 Politics of Bureaucratic Regulation

COM 517 Organizational Communications

COM 537 Conflict Resolution through Communication

***Environment of Public Administration***

POL 545 Urban Politics and Policy

POL 555 Urban Administration

POL 572 Administrative Law

POL 521 Intergovernmental Relations

POL 583 Comparative Public Policy

POL 554 Comparative Development Administration

***Other Courses***

POL 540 Seminar in Public Administration

POL 578 Independent Study in Public Administration

**COURSES OF INSTRUCTION**

Graduate students in Political Science and Public Administration may take no more than two 400-level courses for graduate credit, with the permission of the chairperson of the appropriate graduate committee. Undergraduate courses specified as a condition for admittance to the graduate program do not count as graduate credit.

POL 501. SCOPE AND METHODS OF POLITICAL SCIENCE: Analysis of theoretical approaches to the study of politics and the techniques and methodologies currently employed in political science research. 3 sem. hrs.

POL 502. COLLOQUIUM IN AMERICAN POLITICS: An examination of the various theoretical and empirical approaches developed in the study of American politics. Special consideration will be given to works considered critical in the formation of a scientific study of American political life. 3 sem. hrs.

POL 503. COLLOQUIUM IN COMPARATIVE POLITICS: An examination of various theoretical and empirical approaches in the study of comparative politics and political development with special emphasis on cross-national comparison and the use of aggregate data in comparative analysis. 3 sem. hrs.

POL 504. LEGISLATIVE POLITICS: An examination of the actors, interactions and processes which shape public policy in the legislative arena. This course may be jointly offered with POL 414. In such cases, the graduate requirements will be distinct from undergraduate requirements. 3 sem. hrs.

POL 505. THE POLITICS OF BUREAUCRACY AND REGULATION: Examination of the nature and meaning of bureaucracy in contemporary American society and the devices for its evaluation and control. This course may be jointly offered with POL 413. In such cases, the graduate requirements will be distinct from undergraduate requirements. 3 sem. hrs.

**POL 509. SOVIET FOREIGN POLICY:** This course is designed to provide the student with a broad introduction to Soviet views on East-West relations. The course will deal with cooperative and competitive aspects of those relations in three areas—political, economic, and military, and the problem and opportunities they present for Soviet foreign security and policy. *3 sem. hrs.*

**POL 510. PUBLIC ADMINISTRATION:** Study of the administrative organization, systems, processes, and methods as applied to governmental programs and operations, with a comparison of structural and behavioral approaches. *3 sem. hrs.*

**POL 511. QUANTITATIVE METHODS IN PUBLIC ADMINISTRATION I:** Introduction to research techniques involving quantitative methods and analysis applicable to the formation and implementation of public programs. Emphasis on basic statistics and research methodology. Aimed at an understanding of appropriate application and interpretation of quantitative methods, rather than competence in practical or scholarly use. *3 sem. hrs.*

**POL 512. QUANTITATIVE METHODS IN PUBLIC ADMINISTRATION II:** Continuation of POL 511 with emphasis on application of analytic techniques to specific public management problems. Cost-benefit analysis and public sector applications of operations research will be emphasized. *3 sem. hrs.*

**POL 514. DEVELOPMENT OF POLITICAL THEORY:** Study of the Western political heritage as fashioned by the great Western political thinkers from Plato through Marx and Lenin. *3 sem. hrs.*

**POL 515. INTERNATIONAL RELATIONS:** Analysis of selected theories and approaches in the study of international relations, with particular emphasis on the nature of power and the sources of transformation in the contemporary international system. *3 sem. hrs.*

**POL 516. COMPARATIVE FOREIGN POLICY ANALYSIS:** Systematic analysis of the external factors shaping the foreign policies of selected states and of current models of foreign policy decision-making. Special emphasis will be placed on comparison of Soviet and American policy. *3 sem. hrs.*

**POL 517. AMERICAN FOREIGN POLICY:** Study and analysis of the factors, both internal and external, which have shaped American foreign policy in the post World War II period, the major instruments of policy and their effectiveness, and the impact of changes since 1970. *3 sem. hrs.*

**POL 518. UNITED STATES NATIONAL SECURITY POLICY:** Analysis of United States global security policies and defense strategies with attention to continuities and changes in doctrines, commitments, perceptions of the Soviet threat, and the impact of technology. *3 sem. hrs.*

**POL 519. CHINESE FOREIGN POLICY:** Analysis of the Chinese foreign policy structures and processes as well as the development of Chinese foreign policy and relations with the Soviet Union, the United States, and the Third World. *3 sem. hrs.*

**POL 520. SOVIET POLITICS:** The nature of the Soviet state, its economic system, the role of the Communist party and the influence of Marxist-Leninist ideology will be examined along with contemporary problems and political dynamics. *3 sem. hrs.*



POL 521. INTERGOVERNMENTAL RELATIONS: Study of the interaction process of various levels of government in the United States, including problems of federalism, inter-state cooperation, and federal-urban relations. 3 sem. hrs.

POL 522. SEMINAR IN ASIAN POLITICS: Systematic analysis of the political structure and processes of two or more countries in the Far East and two or more in Southeast Asia, with emphasis on their capabilities to maintain political stability. May be repeated once when focus changes. 3 sem. hrs.

POL 523. LATIN AMERICAN POLITICS: Systematic analysis of the political, economic, and social structures and forces shaping politics in selected Latin American countries. 3 sem. hrs.

POL 525. POLITICS IN THE MIDDLE EAST: Analysis of major political and social forces, such as religion and nationalism, that shape the contemporary Middle Eastern states. 3 sem. hrs.

POL 529. SEMINAR IN EUROPEAN POLITICS: Systematic analysis of the political structures and processes of two or more countries in Western Europe and two or more in the Soviet Union and Eastern Europe, with emphasis on selected contemporary political, economic, and social problems. May be repeated once when focus changes. 3 sem. hrs.

POL 530. SEMINAR: CHINESE POLITICS: Analysis of the political process and policy-making in China with emphasis upon elite interaction concerning leadership succession and economic development strategies. 3 sem. hrs.

POL 531. SEMINAR: JAPANESE POLITICS: Analysis of the political process, policy-making, and select public policies in Japan with emphasis upon the dynamics of one-party democracy and factionalism in Japanese politics. 3 sem. hrs.

POL 535. FISCAL ADMINISTRATION: Study of governmental expenditures and revenues, budgetary and financial reporting, fiscal policy, and other areas of fiscal management, with emphasis on current practices and problems. 3 sem. hrs.

POL 540. SEMINAR IN PUBLIC ADMINISTRATION: Seminar on selected problems in public administration. May be repeated once when topic changes. 3 sem. hrs.

POL 544. MANAGING FOR "SMALLER": An examination of the concept of public management under conditions of declining resources. Analysis of the root causes of urban decline and the problems associated with it. Exploration of non-traditional approaches to local governance in declining areas. 3 sem. hrs.

POL 545. URBAN POLITICS AND POLICY: A study of the political processes and governmental structures in urban areas with emphasis on the relations among governmental units, community power structure, and the formulation and execution of public policy. 3 sem. hrs.

POL 546. SEMINAR PUBLIC OPINION AND POLITICAL BEHAVIOR: Study of conventional and unconventional modes of political behavior; attitudes, opinions and beliefs which are useful in explaining political behavior. Emphasis on the political socialization of children and post-adolescents and on political information processing. 3 sem. hrs.

POL 552. GOVERNMENT PLANNING: Consideration of the planning function in the administrative process and the role of planning agencies in decision making and problem solving. Evaluation of trends and changing characteristics of planning in the United States. 3 sem. hrs.

POL 554. COMPARATIVE DEVELOPMENT ADMINISTRATION: Analysis of the development functions of public administration in selected countries. Focus will be on the administration of development programs as well as on the development of administrative capabilities in the Third World countries. 3 sem. hrs.

POL 555. URBAN ADMINISTRATION: Study of the structures, processes, programs, policies, and problems of administrative agencies of local government, with particular emphasis on metropolitan areas. 3 sem. hrs.

POL 557. SEMINAR: STATE GOVERNMENT AND POLITICS: A comparative study of the political institutions and processes of state governments in the United States, with emphasis on current issues. 3 sem. hrs.

POL 567. INDEPENDENT STUDY IN POLITICAL SCIENCE: Reading and research on special topics in political science under the direction of a faculty member. Research paper. May be repeated once when topic changes. 3 sem. hrs.

POL 569. SEMINAR: SELECTED TOPICS IN POLITICAL THEORY: An examination of selected issues or writers in political thought. Example of topics: political concepts of authority, freedom, contemporary political theorists, modern ideologies. May be repeated once when the content changes. 3 sem. hrs.

POL 571. SEMINAR: JUDICIAL AND CONSTITUTIONAL POLITICS: Special topics, including aspects of the judicial process such as the actors within it (lawyers, juries, judges, prosecutors, police, etc.) and judicial policy making, its substance, the underlying philosophy, and the values attitudes, prejudices, and behavior of its makers. May be repeated once when content changes. 3 sem. hrs.

POL 572. ADMINISTRATIVE LAW: Study of the judicial functions and activities of federal agencies; formal and informal processes in administrative hearings; basic principles of administrative law; judicial interpretation; the question of increased judicialization of the administrative process. 3 sem. hrs.

POL 576. PUBLIC PERSONNEL ADMINISTRATION: Survey of the development of personnel administration in the federal government and some state and municipal governments, focusing on such questions as selection, training, and labor relations. 3 sem. hrs.

POL 577. PUBLIC SECTOR LABOR MANAGEMENT RELATIONS: This course is designed to focus on the labor relations function as it is found in the public sector. Topics to be covered include the rise of government employee labor unions, collective bargaining and policy impacts of public employee unions. 3 sem. hrs.

POL 578. INDEPENDENT STUDY IN PUBLIC ADMINISTRATION: Intensive independent research under the direction of a faculty member. Research paper. May be repeated once when topic changes. 1-3 sem. hrs.

POL 579. SELECTED TOPICS IN PUBLIC POLICY: Policy process, policy outcomes and policy impact in an area or areas of public policy varying among such topics as transportation, education, welfare, national defense, science, civil rights, and urban and community development. May be repeated once when topic changes.

3 sem. hrs.

POL 581. ORGANIZATION THEORY: Survey of current literature and research on the theory of complex organizations. Rationality in decision-making; problems of authority; behavioral, political, and technical influences on organizations.

3 sem. hrs.

POL 583. COMPARATIVE PUBLIC POLICY: Study of the applicability and limitations of current approaches in public policy analysis for cross-national and/or cross-cultural comparison. Emphasis on the analysis of how such public policy issues as defense, welfare, education, and economic development are determined by select political systems in the developed and developing world.

3 sem. hrs.

POL 584. INTRODUCTION TO PUBLIC POLICY: This course is designed to introduce students to the study of public policy and public policymaking. The central concerns of the course involve competing models of the policy process, the policymaking process in the United States, the interplay between the political and economic systems in policymaking, and the processes of policy analysis and policy evaluation.

3 sem. hrs.

POL 590. RESEARCH SEMINAR IN POLITICAL SCIENCE: Directed research on a selected topic in American or comparative politics which requires the application of a specific approach, generation and analysis of data which result in a major research paper.

3 sem. hrs.

POL 595. GOVERNMENT INTERNSHIP: Assignment to appropriate government agencies or units for the purpose of gaining wide experience with the administrative system through a rotating program of work experiences.

3-6 sem. hrs.

POL 596. PUBLIC SERVICE PROJECT: For students currently employed in administrative positions in public or quasi-public agencies. Completion of a written project relating theories and information from the field of public administration to the student's work experience and career objectives.

3-6 sem. hrs.

POL 597. RESEARCH PROJECT: Required of all M.A. students. Completion of the research paper begun in POL 590; evaluation of the substance, methodology, and findings of the paper by the professor; and presentation of the paper to students and faculty of the Political Science department.

3 sem. hrs.

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**Department of  
PSYCHOLOGY (PSY)**

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Kenneth J. Kuntz, Chairperson of the Department

David W. Biers, Director of Human Factors and Research

The Department of Psychology offers three Master of Arts programs:

- **Clinical Psychology**
- **Experimental-Human Factors Psychology**
- **General Psychology**

In all programs emphasis is on integrating theory and literature with appropriate applied experience and on competence in the development of relevant and original research. This is the product of individual supervision and a low student-to-faculty ratio. The aim of the department is to prepare the student for further graduate work at the Ph.D. level and/or for functioning at the M.A. level of specialization in an applied/community setting or through teaching and research.

To further specific research interests graduate students are encouraged to work with faculty members on a one to one basis. Academic advisors and the chairperson of the department will direct students to faculty members who share their specific interests and areas of specialization.

Graduate teaching and research assistantships are available on a competitive basis and include a stipend as well as tuition and fee remission. The Department of Psychology also offers a limited number of traineeships to students in the Clinical Psychology Program. The traineeship placements are at local mental health agencies and vary in number and stipend from year to year depending upon the budgets and needs of the agencies participating in the traineeship program.

## **ADMISSION REQUIREMENTS AND PROCEDURE**

Under normal circumstances a grade point average of 3.0 or better (based on a 4.0 system) is required for admission to the graduate program. In addition, a minimum of 3.0 average in undergraduate course work in psychology is required.

It is expected that the applicant will have completed the requirement of a four-year undergraduate college, usually in liberal arts or science, including a minimum of 15 semester hours in psychology. These psychology courses must include a course in introductory statistics, a course in experimental psychology or research design or the equivalent, and six semester hours in upper-level psychology courses. For students in Clinical Psychology, the upper-level courses should include Abnormal Psychology and Theories of Personality.

Students without psychology preparation may be admitted to the Experimental-Human Factors Psychology program on a conditional basis. Regular admission will follow contingent upon the completion of undergraduate work specified by the admissions committee. Students are urged to contact the Director of Human Factors and Research if they are considering this option.

Acceptance within a specific program is competitive, based upon the strength of the student's application and the number of positions available.

## Applications

Application forms may be obtained from the Office for Graduate Studies at the University of Dayton to which all correspondence concerning the completion of the application should be directed. For the Fall term the application deadline is March 15th. Applications after this deadline will be accepted but will not be reviewed in the original screening of applicants. For information about application for the Spring and Summer terms contact the chairperson of the Department of Psychology.

Inquiries concerning the master's program, its curriculum, and the Department of Psychology should be directed to the Chairperson, Department of Psychology, University of Dayton, Dayton, Ohio 45469. It is the applicant's responsibility to supply the following information necessary for a completed application:

- A. The completed application form.
- B. Official transcripts of all undergraduate schooling (and graduate schooling where appropriate).
- C. At least three letters of recommendation (at least two of these should be from professors familiar with the student's academic work).
- D. Scores on the Graduate Record Examination (both aptitude and Psychology scores are required).
- E. The Miller's Analogies Test score (MAT) is optional.
- F. A summary of undergraduate grade point averages.

Under normal circumstances the chairperson of the Department of Psychology may waive one or more of the application requirements.

## Student Status

Each student admitted to the graduate program is placed in one of the following categories:

1. **Regular standing:** students meeting the entrance requirements of the department.
2. **Conditional standing:** students considered probationary pending the successful completion of 9 to 15 semester hours of graduate work or other requirements as determined by the department.
3. **Unclassified standing:** students enrolled in graduate courses of the department who are not working toward a degree. Normally a student is permitted to enroll for a limited number of semester hours of credit under this status.

## PROGRAM REQUIREMENTS

All students enrolled in any of the three programs leading to the Master of Arts with a major in Psychology are subject to the following general requirements of the Department of Psychology. Full time students normally complete program requirements in four semesters:

1. The number of semester hours and required courses as specified by the individual programs described below.

2. Demonstration of satisfactory progress toward the degree which includes the requirement that students maintain a minimum average of B (3.00) in course work. Students who fail to meet this requirement are either placed on academic probation or dismissed from the program.
3. Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement are dismissed from the program.
4. No more than six semester hours of 400-level courses may apply toward the master's degree, and normally no more than six semester hours of graduate work approved by the chairperson of the department may be transferred from other institutions.
5. Attendance is required at regularly scheduled extra-course seminars on selected issues in psychology and at occasional specialized programs.
6. Thesis must deal with an approved research problem, incorporating an appropriate review of theory and literature, and demonstrating competence in the application of research methodology.
7. Students are expected to conduct themselves in a professional and ethical manner in accordance with generally accepted standards for psychologists.
8. It is the student's responsibility to know and to meet the requirements of the University and of the graduate program.

## CLINICAL PSYCHOLOGY

In addition to a broad academic background and competence in the application of research methodology, the Clinical Psychology program provides the student with:

- (a) Thorough exposure to the areas of personality, psychopathology, and psychotherapy,
- (b) Intensive training in the assessment of intelligence and personality,
- (c) Supervised practice in interviewing and therapeutic intervention, and
- (d) The opportunity to specialize in either child or adult treatment.

Through practicum experience in various community and clinical settings affiliated with the University, the student can translate classroom learning into practical experience. The program is designed to prepare the student for competence at the M.A.-level or for pursuing a doctoral degree in Clinical Psychology.

The Master of Arts with a major in Psychology (Clinical) requires 45 semester hours consisting of 41 hours of academic course work, including thesis, and four hours of practicum as specified below.

	<i>Semester Hours</i>
<b>Core Requirements:</b> .....	<b>12</b>
PSY 501 Experimental Design and Statistics I.....	3
PSY 502 Experimental Design and Statistics II .....	3
PSY 510 Proseminar .....	3
PSY 599 Thesis .....	3

**Clinical Requirements:**

Child Track: .....	24
PSY 550 Interviewing .....	2
PSY 551 Assessment of Intelligence .....	3
PSY 553 Psychopathology .....	3
PSY 555 Theories of Personality & Psychotherapy .....	3
PSY 556 Assessment of Personality .....	3
PSY 560 Psychotherapy & Behavior Change with Children .....	3
PSY 569 Clinical Practica .....	4
PSY 573 Developmental Psychology .....	3
Adult Track: .....	21
PSY 550 Interviewing .....	2
PSY 551 Assessment of Intelligence .....	3
PSY 553 Theories and Research in Psychopathology .....	3
PSY 555 Theories of Personality and Psychotherapy .....	3
PSY 556 Assessment of Personality .....	3
PSY 564 Individual Psychotherapy .....	3
PSY 569 Clinical Practica .....	4

**Clinical Electives:**

Child Track: .....	9
At least one of the following:	
PSY 563 Cognitive-Behavior Therapy	
PSY 564 Individual Therapy	
PSY 566 Marriage and Family Therapy .....	3
At least three semester hours of:	
PSY 567 Special Topics in Clinical Psychology (1 cr. each) .....	3
Free Elective: .....	3
Adult Track: .....	12
At least two of the following:	
PSY 558 Group Psychotherapy	
PSY 563 Cognitive-Behavioral Therapy	
PSY 565 Ethics in Assessment and Therapy	
PSY 566 Marriage and Family Therapy .....	6
At least three semester hours of:	
PSY 567 Special Topics in Clinical Psychology (1 cr. each) .....	3
Free Elective .....	3

Total Semester Hours    45

**EXPERIMENTAL-HUMAN FACTORS PSYCHOLOGY**

The Master's program in Experimental-Human Factors Psychology is designed for the student who wishes to integrate the theory, methods, and data of experimental psychology with that of human factors. The overall program is structured to prepare the student for further graduate study in experimental psychology or human factors at the Ph.D. level, and/or for a career as a research-

applied scientist in human factors psychology. The curriculum stresses integration of knowledge in three key areas: (1) the theoretical issues and quantitative research methodology associated with perception, human information processing, motor skills, and other psychological processes; (2) the application of the knowledge about basic psychological processes to the development of equipment, equipment interfaces, and work environments; and (3) the tools which the human factors specialists applies to system analysis, design, test, and evaluation. Emphasis is on the integration of course work with research and practical experience.

The Master of Arts with a major in Psychology (Experimental-Human Factors) requires 39 semester hours, including thesis, as specified below.

	<i>Semester Hours</i>
<b>Core Requirements</b> .....	<b>12</b>
PSY 510 Proseminar .....	3
PSY 501 Experimental Design & Statistics I .....	3
PSY 502 Experimental Design & Statistical II .....	3
PSY 599 Thesis .....	3

<b>Experiment-Human Factors Core Requirements</b> .....	<b>15</b>
PSY 533 Engineering Psychology .....	3
PSY 531 Human Factors in Systems Development .....	3
PSY 529 Perception .....	3
PSY 524 Human Information Processing .....	3
PSY 539 Practicum in Human Factors .....	3

<b>Electives</b> .....	<b>12</b>
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Courses may be selected from the following list or, with permission of the program director, from other graduate courses within the department, and from graduate courses outside the department in such related disciplines as engineering or computer science. No more than six hours of courses taken outside the department may count toward program credit.

PSY 506 Selected Topics in Advanced Research Methodology .....	3
(May be taken more than once for credit)	
PSY 534 Human Computer Interaction .....	3
PSY 522 Advanced Cognitive .....	3
PSY 528 Psychophysiology .....	3
PSY 532 Special Topics in Human Factors .....	3
(May be taken more than once for credit)	
PSY 536 Training System Development .....	3
PSY 537 Team and Group Processes .....	3
PSY 596 Experimental Research .....	1-3
PSY 597 Readings .....	1-3
<b>Total</b>	<b>39</b>

## GENERAL PSYCHOLOGY

For students desiring a very broad background in psychology as well as for students with specific specialized or interdisciplinary interests and career goals



the Master of Arts in General Psychology is offered. Before matriculation, or very early in the student's graduate career, the student and an advisor appointed by the chairperson of the department specify objectives and design a curriculum tailored to the individual student. Courses selected reflect the students needs and objectives, the requirements of the Department of Psychology, and may include graduate courses from other departments of the university. Electives may be used to develop a concentration in the student's area of interest.

The Master of Arts with a major in Psychology (General) requires 36 semester hours, including thesis, as specified below.

<b>Core Requirements</b> .....	12
PSY 501 Experimental Design and Statistics I .....	3
PSY 502 Experimental Design and Statistics II .....	3
PSY 510 Proseminar .....	3
PSY 599 Thesis .....	3

**General Psychology Requirements** .....12  
Four courses, normally one each from the areas of Clinical, Developmental, Experimental, and Social, selected in consultation with the advisor.

**Electives** .....12  
Twelve semester hours, some of which may be from other departments of the university, selected in consultation with the advisor.

Total Semester Hours      36

COURSES OF INSTRUCTION

PSY 501. EXPERIMENTAL DESIGN AND STATISTICS I: Study of the logic of the design of experiments in psychology with special emphasis on the use of the analysis of variance. Students will be expected to perform statistical procedures on the computer using canned statistical packages. Prerequisite: undergraduate statistics. 3 sem. hrs.

PSY 502. EXPERIMENTAL DESIGN AND STATISTICS II: Further study of the logic of the design of experiments in psychology with special emphasis on the use of bivariate correlation and regression, and multiple regression. Students will be expected to perform statistical procedures on the computer using canned statistical packages. Prerequisite: PSY 501. 3 sem. hrs.

PSY 506. SELECTED TOPICS IN ADVANCED RESEARCH METHODOLOGY: Study of special topics in statistics, research design, behavior research methods, and computer technology. The specific topic will vary from one offering to the next. Possible topics include: applied multivariate statistics, programing microcomputers for psychology experiments, evaluation research methods, program evaluation, and performance measurement. May be repeated. Permission of instructor. 3 sem. hrs.

PSY 510. PROSEMINAR: An extensive survey of the theories and research paradigms that comprise the science of psychology. Topics include an historical overview of the field, the structure of the modern profession, and selected current areas of application and inquiry. Prerequisite: Graduate student status or permission of instructor. 3 sem. hrs.

**PSY 522. ADVANCED COGNITIVE PROCESSES:** Basic research paradigms for the experimental investigation of cognitive processes, with attention to the current information-processing theories of cognition. Topics include selective attention, visual short-term memory, pattern recognition, encoding processes, imagery, search and retrieval processes, theories of human memory, and cerebral dominance. *3 sem. hrs.*

**PSY 524. HUMAN INFORMATION PROCESSING:** Current psychological and artificial intelligence models of cognition. Topics include coding mechanisms in the central nervous system, simulation of sensory processes and recognition, computer models of human memory, semantic information processing by humans and machine, fast retrieval theories: recent theories of language comprehension and problem solving. *3 sem. hrs.*

**PSY 526. HISTORY AND SYSTEMS:** Traces the evolution of psychology since 1890. Emphasis is placed on integrating the various systems and schools of thought within the spectrum of modern psychology. (Also PSY 471.) *3 sem. hrs.*

**PSY 528. PSYCHOPHYSIOLOGY:** Neurophysiology of attention, sensation, perception, emotion, learning, memory, and motor control. Emphasis on electrophysiological indicants and cybernetical analyses. *3 sem. hrs.*

**PSY 529. PERCEPTION:** Systematic study of methods and research findings in the field of human perception, with an evaluation of theoretical interpretations. Prerequisites: PSY 501 or permission of instructor. (Also PSY 323.) *3 sem. hrs.*

**PSY 531. HUMAN FACTORS IN SYSTEM DEVELOPMENT:** Introduction to human factors during the system development process. Treats the design process from initial conceptual stages to final testing and evaluation. Emphasis is upon methods and techniques which permit development of data to support human factors functions throughout the process. *3 sem. hrs.*

**PSY 532. SPECIAL TOPICS IN HUMAN FACTORS:** Wide ranging topics related to Human Factors Psychology are envisioned. For example: human tracking performance, tactual communication, vigilance, motor memory, skill development, visual displays, technical invention, electrophysiological indicants of human performance, etc. May be repeated. Prerequisite: graduate standing or permission of the instructor. *1-3 sem. hrs.*

**PSY 533. ENGINEERING PSYCHOLOGY:** Treatment of the relationship between problems in human factors engineering and theory-based research in experimental psychology and human performance. Topics covered include theory and research in such areas as decision making, attention, perception, and motor performance and their potential application to the design of the person-machine interface in complex systems. Prerequisite: Permission of instructor. *3 sem. hrs.*

**PSY 534. HUMAN COMPUTER INTERACTION:** A critical review of human factors issues in the design of user interfaces of interactive computer systems. Emphasis will be placed on topics of cognitive engineering as they apply to user-centered systems design. Prerequisites: PSY 524 and basic programming course in computer science, or permission of instructor *3 sem. hrs.*

**PSY 536. TRAINING SYSTEM DEVELOPMENT:** Treatment of the systems approach to training program analysis, design, and evaluation. Topics covered include assessment of training objectives, development of training program content, selection of training media, application of simulation technology, and program evaluation procedures, including transfer of training methodology. Prerequisite: PSY 531 or permission of instructor. *3 sem hrs.*

PSY 537. TEAM AND GROUP PROCESS: Study of group processes and theories with special application to team training, communication, performance, and coordination in human factors settings and problems. *3 sem. hrs.*

PSY 539. HUMAN FACTORS PRACTICUM: Experience in applying the theory, methods, and data of experimental-human factors psychology to person-machine problems is acquired through placement in an approved human factors organization. Prerequisites: PSY 501, 524, 529, 531 and 533 or permission of the director of Human Factors Program. *3 sem. hrs.*

PSY 550. INTERVIEWING: Introduction to basic interviewing skills with adults and children. Specific types of clinical interviews are examined. Supervised practice conduction interviews and writing reports. Prerequisite: Graduate status in Clinical Program. *2 sem. hrs.*

PSY 551. ASSESSMENT OF INTELLIGENCE: Theoretical rationale and techniques of individual mental testing, with emphasis on the Wechsler Scales and the Stanford-Binet. Major content areas include theories of intelligence, test development and evaluation, clinical interpretation, and current research. Prerequisite: Graduate status in Clinical Program or permission of instructor. *3 sem. hrs.*

PSY 553. THEORIES AND RESEARCH IN PSYCHOPATHOLOGY: Survey of major theories, research evidence, and methodological problems in determining the etiology of the various behavior disorders. Practice in the use of diagnostic classifications. *3 sem hrs.*

PSY 555. THEORIES OF PERSONALITY AND PSYCHOTHERAPY: Survey and critical analysis of the major current theories of personality and psychotherapy integrating their contributions into a diversified, functional, and adaptable approach to therapy. Prerequisite: PSY 553. Permission of instructor. *3 sem. hrs.*

PSY 556. ASSESSMENT OF PERSONALITY: Variety of approaches to personality assessment as well as the techniques of administration and interpretation of specific instruments. Emphasis is on the MMPI, Rorschach, and TAT. Strategies of test construction and evaluation, ethical issues, and research are discussed. Prerequisite: Graduate status in Clinical Program or permission of instructor. *3 sem. hrs.*

PSY 558. GROUP PSYCHOTHERAPY: Survey of theories and techniques of group psychotherapy, including a review of the theoretical and empirical literature, as well as a training group experience. Prerequisite: PSY 555 or permission of instructor. *3 sem. hrs.*

PSY 560. PSYCHOTHERAPY AND BEHAVIOR CHANGE WITH CHILDREN: Provides an introduction to the methods of prevention and treatment of cognitive, emotional, and behavioral disorders in childhood and adolescence. Includes the dynamic processes underlying therapy with children: methods and techniques: assessing the process of therapy; and the symbolic communication of children through play, art and language. Relevant research is reviewed. Prerequisite: Graduate status in Clinical Program or permission of instructor. *3 sem hrs.*

PSY 563. COGNITIVE-BEHAVIORAL THERAPY: An examination and evaluation of the theoretical foundations and clinical applications of cognitive-behavioral models of behavior change. Prerequisites: Graduate standing in Clinical Program and PSY 555 or permission of instructor. *3 sem. hrs.*

**PSY 564. INDIVIDUAL PSYCHOTHERAPY:** In-depth study of the principles and techniques of dynamic, individual psychotherapy as developed from clinical and empirical findings. Prerequisite: PSY 555 or permission of instructor. *3 sem hrs.*

**PSY 565. ETHICS IN CLINICAL ASSESSMENT AND PSYCHOTHERAPY:** An examination of the conceptual structures, the derivation of ethical principles and their application in the general framework of client assessment and the practice of psychotherapy. Discussion includes evaluating ethical codes, assessment practices, the techniques of psychotherapy and significant problems arising in clinical practice. Prerequisite: Graduate status or permission of the instructor. (Also PHL 658). *3 sem hrs.*

**PSY 566. FAMILY AND MARRIAGE THERAPY:** Survey of the major therapeutic approaches to family and marital problems and related research findings. Prerequisites: PSY 555 or permission of instructor. *3 sem. hrs.*

**PSY 567. SPECIAL TOPICS IN CLINICAL PSYCHOLOGY:** A variable topics course on issues relevant to the training of students preparing for work in clinical psychology. May be repeated with different topics. Prerequisite: Graduate status in Clinical Program or permission of instructor. *1-3 sem. hrs.*

**PSY 568. RESEARCH AND PRACTICE IN HEALTH PSYCHOLOGY:** A critical evaluation of the application of Psychology in health. Topics range from psychophysiology and biofeedback to the psychological and social dimensions of health, illness, and coping with stress. Students will evaluate research publications in the field and engage in clinically oriented research projects. *3 sem. hrs.*

**PSY 569. CLINICAL PRACTICUM:** Experience in interviewing, psychological testing and therapy is acquired through placement in approved mental health agencies. Prerequisite: clinical standing and concurrent registration in assessment and therapy courses. Clinical students register for one semester hour of practicum each term. To be repeated to four semester hours. *1 sem. hr.*

**PSY 573. DEVELOPMENTAL PSYCHOLOGY:** The science of human development with emphasis on theory, research, methods, findings and applications. Topics selected from but not limited to: personality and social development, language acquisition, problem-solving, attachment, sex roles, children's rights, moral and prosocial behavior, family relations and extrafamilial influences such as television and schools. Prerequisite: graduate standing or permission of the instructor. *3 sem. hrs.*

**PSY 574. COGNITIVE DEVELOPMENT IN CHILDREN:** Major approaches to the study of cognitive development: attentional and mediational development as demonstrated in children's learning, memory, and problem solving; language development and Piaget's theory. Prerequisite: graduate standing or permission of instructor (also PSY 452.) *3 sem. hrs.*

**PSY 585. EXPERIMENTAL SOCIAL PSYCHOLOGY:** Designed to provide information and perspective about such social psychological topics as attitude change, interpersonal attraction, fairness in exchange, attribution, aggression, helping and intrinsic motivation. Prerequisite: graduate standing. *3 sem. hrs.*

**PSY 588. INTERPERSONAL PROCESSES:** Seminar in research in some prominent sub-areas of Social Psychology. Emphasis on critical skills and research ideas in topics as non-verbal communication, self-indulgence, affiliation and attraction, and equity theory. Prerequisite: PSY 585, permission of instructor. *3 sem. hrs.*

**PSY 595. SEMINAR IN SPECIAL TOPICS IN PSYCHOLOGY:** Various topics of special interest to faculty and students. An intensive critical evaluation of the appropriate literature. May be repeated. Prerequisite: graduate standing or permission of instructor. *1-3 sem. hrs.*

**PSY 596. EXPERIMENTAL RESEARCH:** Individual graduate students explore particular research areas. Under guidance of the instructor, research projects are formulated and conducted. Project reports are required. May be repeated. Prerequisite: permission of instructor. *1-3 sem. hrs.*

**PSY 597. READINGS:** Designed for individual, student-faculty study in a specialized area of interest. Topic and criteria for evaluation to be specified prior to registration. May be repeated. Prerequisite: permission of instructor. *1-3 sem. hrs.*

**PSY 599. THESIS:** An original research project incorporating an appropriate review of theory and literature and demonstrating competence in the application of research methodology. Required of all graduate students. *3 sem. hrs.*

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## **Department of RELIGIOUS STUDIES (REL)**

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Reverend James L. Heft, S.M., Chairman of the Department, and  
Director of the Program.

The Department of Religious Studies is an ecumenical community of students and professors engaged in the study, research, and interpretation of religious issues. It considers these issues from the context of the more classical disciplines of the Judaeo-Christian heritage, with particular emphasis on the Roman Catholic tradition, as well as the burgeoning areas of multi-cultural and cross-disciplinary concerns. It offers a Master of Arts individualized to meet each student's need, whether it be for an advanced degree or professional preparation. The student may therefore choose to follow one of two programs which lead to the Master of Arts degree.

## **PROGRAM IN THEOLOGICAL STUDIES**

The master's program in Theological Studies offers a comprehensive approach to the study of theology and religion. Each student is expected to develop an understanding of biblical sources, historical developments, moral and contemporary theologies, especially in the Roman Catholic tradition. Ecumenical perspectives, among Christians and world religions, provide an important matrix for study.

## **PROGRAM IN PASTORAL MINISTRIES**

The master's program in Pastoral Ministries offers the student an opportunity to prepare for a variety of service careers emerging in the contemporary Church. Courses and workshops, particularly in religious education and telecommunications, family and parish ministries, and the social teachings of

the Church, ensure the vitality of the program. This program, grounded in the study of theology, shaped distinctively by general principles of pastoral ministry, is open to a variety of applications. It prepares students for pastoral positions in catechetics and religious education, family, parish and campus ministry. Taking into account the individual interests and needs of the students the program responds to contemporary pastoral needs through an integration of theory and practice.

## **SPECIAL RESOURCES**

Students have the opportunity to draw upon the resources of other departments of the University, as well as upon the Centers of the University (the Family Center and the Center for Christian Renewal, in which may be found the offices for Creative Ministry, Educational Services and Religious Telecommunications). Interaction with an area seminary and other institutions, interchange of facilities, sharing of library resources, cooperative innovative programming, and cross-registration makes available to students not only a greater variety of courses but also provides the opportunity for even more flexible construction of their degree programs.

The University of Dayton is also the home of the International Marian Research Institute which administers a doctoral program in Theology (S.T.D.) sponsored by the Pontifical Marianum University in Rome. Graduate students in the Department of Religious Studies may take courses in the Institute. Consult the chairperson for further information.

## **GRADUATE ASSISTANTSHIPS**

The department offers several graduate assistantships granted on a competitive basis. They provide for tuition remission for 18 credit hours a year and an annual stipend. Write the chairperson for further information.

## **ADMISSION REQUIREMENTS**

An applicant is admitted to graduate study if the admitting committee of the department is satisfied that the applicant is fully qualified to undertake graduate study. Twenty-four semester hours in philosophy and theology with a 3.0 grade-point average or their equivalent is recommended. Adjustments may be made by the chairperson for special situations.

## **PROGRAM REQUIREMENTS**

Each program, though different in its internal structure, requires 36 credit hours for graduation. In the construction of a program it is expected that the majority of the student's course work will be taken in the Department of Religious Studies. A 3.0 quality point average in departmental courses and in the student's overall program is required for graduation.

Both programs in the Master of Arts are to be pursued in an individualized manner. Upon admission to the program each student (in conjunction with a graduate advisor and taking into consideration the student's needs, interest, and background) is to draw up a proposal for the program to be followed. This program proposal is then submitted to the Graduate Committee of the department for its approval.

The programs leading to the master's degree may be pursued in summer sessions with courses of one to six weeks duration, or be pursued full-time, i.e., throughout the year. They must be completed within seven calendar years from the time of matriculation.

## **STRUCTURE OF THE PROGRAMS AND COURSE WORK**

### **THEOLOGICAL STUDIES**

Three arrangements are possible:

- (1) 36 hours of course work, with the submission to the graduate committee of the Department of a research paper done as a part of one of the courses taken between the 15th and 24th hour of course work;
- (2) 33 hours of course work and a 3 hour project; or
- (3) 30 hours of course work and a 6 hour thesis. An oral defense of the thesis is required.

### **PASTORAL MINISTRIES**

This program is divided into three parts:

- (1) theological foundations (12-15 hours);
- (2) basic principles for effective ministry (6-9 hours); and
- (3) the practice and study of specific ministries (9-12 hours), including a pastoral/theological synthesis seminar (3 hours).

### **Language Proficiency**

There is no language requirement for the degree. For specialization in the biblical or historical areas a working knowledge of the language employed in the area, e.g., Hebrew, Greek, or Latin, is encouraged. The language proficiency is particularly recommended for those students preparing for doctoral work.

## **COURSES OF INSTRUCTION**

### ***Biblical Languages***

REL 501, 503. BIBLICAL HEBREW I, II; Introduction to the morphology and syntax of biblical Hebrew to facilitate the handling of basic tools and the reading of simple prose texts. *3 sem. hrs. each.*

REL 502, 504. BIBLICAL GREEK I, II; Introduction to Hellenistic Greek. Vocabulary, grammar, and syntax. Selective readings of New Testament texts. *3 sem. hrs. each.*

### ***Biblical Studies***

REL 511. CONTEMPORARY OLD TESTAMENT CRITICISM: Introduction to the principal methodological approaches to the Old Testament and a survey of the major results of contemporary biblical scholarship. *3 sem. hrs.*

REL 547. CONTEMPORARY SPIRITUALITY: An examination of the meaning of Christian Spirituality in light of the Scriptures and contemporary theological insights. Emphasis on the baptismal roots of the call to Christian holiness and the principal dimensions of this call, coupled with a study of the various states of life that can lead to the fullness of Christian perfection. 3 sem. hrs.

REL 548. THEOLOGY OF PRAYER: Study of the meaning of prayer, focusing on prayer in the Hebrew and Christian Scriptures, prayer as reflected in selected classical mystical writers, and contemporary approaches to prayer. 3 sem. hrs.

REL 549. MARIAN QUESTION TODAY: Detailed treatment of selected issues of contemporary interest relating to the role of the Virgin Mary in the history of salvation. May be taken more than once. 3 sem. hrs.

### ***Christian Ethics***

REL 561. APPROACHES TO MORALITY: An attempt to establish the foundations of Christian morality, consisting of an historical survey of approaches and developments from the New Testament period to the present. 3 sem. hrs.

REL 562. CONTEMPORARY MORAL PROBLEMS: An open approach to contemporary moral issues within theological perspectives. 3 sem. hrs.

REL 568. EVOLUTION AND ETHICS: The contemporary theology of Christian existence as a whole, stressing the conscious unity of existence; the implications of evolution for theology and ethics. 3 sem. hrs.

### ***Religion and Culture***

REL 571. THE IMAGINATION AND MODERN THEOLOGY: An attempt to show the role of reason and the imagination in the formulations of various approaches to theological issues. 3 sem. hrs.

REL 575. THEOLOGY AND THE FILM: Focus on the mutual issues of film and religion as both reflect and affect the values and images of a culture. 3 sem. hrs.

REL 576. THEOLOGY AND ART: An investigation into the relationship between religion and art with a treatment of Renaissance and post-Renaissance painting and sculpture as manifestations of Christian apocalyptic and humanistic worldviews at given times. 3 sem. hrs.

REL 577. THE RELIGIOUS QUEST IN LITERATURE: Study of the religious quest as found in various modes of poetry, novel, drama with emphasis on the form of literary expression. 3 sem. hrs.

### ***Pastoral Ministries***

REL 581. THEOLOGY OF REVELATION: Study of God's self-disclosure to His people as found in scripture, tradition, and the living experience of the Church immersed in history. 3 sem. hrs.

REL 582. MODELS OF CATECHESIS: A consideration of the role that model play in the development and teaching of the basics of Christian belief — Jesus, grace, church, redemption, and sin. May be repeated for credit when topic changes. 3 sem. hrs.



REL 583. RELIGIOUS PSYCHOLOGY: Study of the human response to God in the light of contemporary psychology. The implications for catechesis in the various stages of human development, in the process of conversion and commitment, and in the crises of faith. 3 sem. hrs.

REL 584. CONTEMPORARY CATECHETICAL PROCESS: An attempt to identify and relate specific characteristics of various historical and contemporary approaches to religious education. Specific emphasis on the thought of authors such as Bushnell, Moran, Westenoff, and Lee, exploring their impact on developing a philosophy of religious education in a pluralistic society for the future. May be repeated for graduate credit when topic changes. 3 sem. hrs.

REL 585. PASTORAL COUNSELING: Brief study of the methods of counseling with emphasis on those modes most in practice today. Concentration on the major problems faced by counselors in the pastoral area. 3 sem. hrs.

REL 586. LEADERSHIP IN PARISH MINISTRY: Study of the traditional parish structure as seen against the background of biblical and historical perspectives on the local church. An examination of the forces for change in the contemporary parish with an effort, out of the theoretical framework of leadership and administration, to assist the student in developing a philosophy and strategy of leadership. 3 sem. hrs.

REL 587. RELIGIOUS STUDIES AS AUTOBIOGRAPHY: An invitation to reflect systematically on the religious dimension of one's own life story by asking questions about meaning, purpose, values, and identity, through the study of the lives of great religious figures. An assessment of the potential of this autobiographical approach for religious education. 3 sem. hrs.

REL 588. TEACHING MORALS AND VALUES IN RELIGIOUS EDUCATION: An integration of theory and practical techniques for teaching Morals and Values in religious education today. An exploration of Value and Moral Development with special emphasis on authors such as Piaget, Kohlberg, Erikson, Fowler, and Rokeach. May be repeated for graduate credit when topic changes. 3 sem. hrs.

### ***General Courses of Instruction***

REL 590. SELECTED QUESTIONS: A study of specific questions and developments in biblical, historical, systematic, or catechetical theology. May be taken more than once. 3 sem. hrs.

REL 592. CONTEMPORARY ISSUES: A graduate workshop and/or seminar investigating and analyzing a specific area of theology and interdisciplinary scholarship concerning contemporary issues. 1-6 sem. hrs.

REL 593. DIRECTED STUDY: A directed study of a particular theologian, problem, or historical period. May be taken more than once. 1-3 sem. hrs.

REL 599. THESIS 6 sem. hrs.

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## VIII SCHOOL OF BUSINESS ADMINISTRATION

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Sam Gould, Dean

Henry H. Stick, Associate Dean and Director, M.B.A. Program

### THE MBA PROGRAM

The MBA Program was established in 1963. It is a broadly based program designed to develop creative and effective managers for private and public sector organizations.

Over 3,500 men and women from a wide range of academic and professional backgrounds have graduated. They have assumed positions of key responsibility within the local area and world-wide. Strong linkages with the community serve to assure program vitality and responsiveness to corporate, governmental, and non-profit organization needs.

The hallmark of the program is the application of academic theory to the practical problems faced by students. By providing an understanding of the functional disciplines such as accounting, finance, quantitative techniques, and human relations followed by the synthesis of this knowledge in policy courses, the program seeks to provide the capabilities needed for career and personal enhancement. Development of analytical competence as well as effective oral and written expression is stressed. Quantitative and qualitative skills receive balanced emphasis.

The student is expected to attain:

- A. Leadership and managerial ability
- B. Decision making capability within an ethical context
- C. Technical mastery of functional disciplines

Commitment by the faculty to the student pursuing these objectives provides the basis for the University's claim to "a tradition of excellence."

### STUDENTS

Students studying for the MBA degree come from a variety of educational and work backgrounds which has served to enrich the program. Approximately 50% have a business undergraduate degree, 20% engineering, with the remainder from a diversity of fields. Large companies, small companies, non-profit groups, and government organizations are represented in the program.

Average age is 29 years which means the student has five or more years of work experience. Only a few students proceed directly from undergraduate to graduate work. Thirty-five percent of the students are women.

Nearly all students are employed full-time, taking one or two courses each semester. This means that the average time to complete the program is two-and-a-half to three years, depending on survey course requirements.

## ADMISSION REQUIREMENTS

The applicant for admission to the MBA Program is expected to hold a bachelor's degree from an accredited college or university. The degree may be in business administration or any other field.

The initial step in the admissions process is to submit an application form to the MBA office. Letters of recommendation are not required. New students may be admitted into the program until one week before classes begin.

The registrars of all colleges or universities previously attended, excluding UD, should be requested to forward an official transcript of prior academic records to the MBA Office.

Application for the Graduate Management Admission Test (GMAT), which is required of all students, should be submitted directly to the Educational Testing Service, Princeton, New Jersey 08541. The GMAT is given four times/year at universities throughout the country with results made available to the MBA Office by the testing service.

Admission to the program is granted to students showing high promise for success in postgraduate business study. Indicators of high promise for success used in student evaluation are:

1. Undergraduate and other collegiate records as indicated by official transcripts from all universities and colleges attended.
2. Results of the GMAT.

The decision on admissions provided after receipt of the application, transcripts, and GMAT results. The latter become available approximately one month after the test is taken. If, for example, the GMAT is taken in October, the admission decision will be provided by December 1, allowing sufficient time to register for the January term.

Students with an undergraduate grade point average of at least 3.0 (on a 4.0 scale) or with other evidence of high promise for success in post graduate business study, may register under 'unclassified status' for one semester, during which time the student is required to complete the GMAT and submit the score to the MBA Director. Students are not permitted to register under 'unclassified status' for a second term without having taken the GMAT.

## MBA CURRICULUM

The MBA Program is a thirty-six semester credit hour program for the student with an undergraduate background in business. For the student with a non-business background, or who lacks course work in key areas of undergraduate business study, prerequisite courses are required.

Thirty semester hours (ten courses) are prescribed for all students. Additional breadth or depth in a selected subject area may be achieved by taking two elective courses for the required program total of twelve courses.

An additional option available is the opportunity to pursue up to three hours of independent research. There is no thesis or comprehensive examination at the end of the program.

## A. PROGRAM OF STUDY

There are three classifications of courses in the M.B.A. Program:

**Group I — Survey Courses**

**Group II — Core Courses**

**Group III — Elective Courses**

Before taking core and elective courses, the student is expected to have acquired basic knowledge in eight business areas: accounting, economics, finance, marketing, management, statistics, and quantitative techniques to include computer use. Students with an undergraduate degree in Business Administration normally have met the survey requirements and proceed with Groups II and III, core and elective courses.

Thirty-six semester hours of core and elective courses are required for the MBA degree. Where the survey courses are required because of an undergraduate deficiency in one or more of the eight areas specified below, the total number of hours required will be accordingly greater. All MBA courses are three semester-hour courses with the exception of MBA 500G, MBA 500I and MBA 595 "Individual Research." These courses vary from 1-3 semester hours. All courses, exclusive of the surveys, must be completed within five calendar years of enrollment in the first course.

**Group I. Survey Courses:** Any student having an undergraduate course deficiency (i.e., lacking course work in any one or more of the following areas) is required to make up that deficiency. This is generally done by taking the appropriate course(s) from the graduate survey courses:

MBA 500-A	Graduate Survey in Economics (3.0 sem. hrs.)
MBA 500-B	Graduate Survey in Accounting (3.0 sem. hrs.)
MBA 500-C	Graduate Survey in Marketing (3.0 sem. hrs.)
MBA 500-D	Graduate Survey in Management and Organizational Behavior (3.0 sem. hrs.)
MBA 500-E	Graduate Survey in Statistics (3.0 sem. hrs.)
MBA 500-F	Graduate Survey in Finance (3.0 sem. hrs.)
MBA 500-G	Graduate Survey in Computer Methods (1.0 sem. hrs.)
MBA 500-I	Graduate Survey in Quantitative Methods (2.0 sem. hrs.)

Whenever survey courses are required, they must be completed before proceeding to core courses. However, a student may take core courses during the term in which the last survey is being completed. For example, if the student has only the Graduate Survey in Finance to take, and wishes to carry a six-semester-hour load, one of the core courses (except the Finance core course, MBA 520) may be taken simultaneously with the last remaining survey course.

In some cases the deficiency can be eliminated by passing a proficiency test

in the area(s) to waive the requirement(s). The proficiency is normally undertaken when the student has had some course work in the area or areas related to the survey course but not sufficient work to warrant its acceptance as fulfilling the course requirement.

Proficiency exams are administered at no cost to the student. They can be scheduled at the student's convenience by calling the MBA Office.

Alternatively, survey requirements may be fulfilled via undergraduate work prior to matriculation into the MBA Program. For example, in Columbus, some students have elected to meet the survey requirements through undergraduate work at Otterbein College, Franklin University, or Ohio State University. For information on appropriate undergraduate courses to waive survey requirements, contact the MBA Office.

**Group II. Core Courses:** The Core portion of the program consists of 36 semester hours (12 courses) which includes two electives.

A. The following ten courses are required:

MBA 501	Managerial Accounting
MBA 510	Quantitative Methods of Business Decisions
MBA 520	Managerial Finance
MBA 530	Marketing Management
MBA 540	Managerial Economics
MBA 560	Operations Management
MBA 563	Management Information Systems
MBA 571	Organizations and Their Environments
MBA 587	Organizational Behavior
MBA 590	Business Policies and Administrative Management

Students with an undergraduate accounting major or a CPA should not schedule the Managerial Accounting course (MBA 501) but should instead complete an additional elective.

**Group III. Elective Courses:** Two elective courses are required. They may be selected to obtain more program breadth or depth in a particular functional area. The student may choose from among the other MBA courses described on the following pages, or with permission, students may elect graduate courses from the College of Arts and Sciences and other Schools of the University when these are appropriate to their education plans.

For example, a student could achieve program breadth in Corporate Public Affairs by scheduling an appropriate elective from course offerings within the Department of Political Science, or the student may wish to develop a more thorough understanding of computers by using an elective from the Department of Computer Science.

## B. COURSE SEQUENCE

The student should note carefully the requirements regarding course sequence. Survey courses must be completed before proceeding to core and elective courses, with the exception of combining core courses with a last remaining survey course as explained above. Also note the following: MBA 500B, Survey in Accounting, is a prerequisite to MBA 500F, Survey in Finance.

MBA 500G, Survey in Computer Methods and MBA 500I, Survey in Quantitative Methods are prerequisites to MBA 500E, Survey in Statistic, (MBA 500G may be taken concurrently.)

MBA 501 is a prerequisite to MBA 520, Managerial Finance.

MBA 510 is a prerequisite to MBA 560, Operations Management.

MBA 520 is a prerequisite to MBA 521, Problems of Finance.

MBA 501 or MBA 520 or premission of the instructor are prerequisites to MBA 525, Investments and Financial Markets.

MBA 530 is a prerequisite to MBA 535 or MBA 536.

MBA 586 or MBA 587 is a prerequisite to MBA 588, Seminar in Current Organizational Behavior Topics.

MBA 590, Business Policies and Administrative Management, may be taken only after the completion of 21 semester hours of core and elective courses. Exceptions to the above require approval of the MBA Director

## C. INDIVIDUAL RESEARCH

The MBA program does not require a thesis. Students who have an interest in doing the kind of research involved in a thesis should note the course description for MBA 595, Individual Research, which can qualify from one to three semester hours of credit.

The student may do the research project in an area of choice, but it should not consist of work that would normally be done during the course of a regular job. It could, however, be job related.

Before undertaking the project, the student should have a clear idea of objectives and the methodology to be employed. A literature search and development of the bibliography should precede submission of the project for approval.

Approval is obtained by completing a project proposal form available from the MBA Office. The form must be submitted and approved before registering for the course. It is necessary to obtain approval during the term preceding that in which registration is planned. A faculty advisor is assigned to review and approve the proposal and to guide the student in the research effort. The length and detail of the research-based report depend on the subject material and are to be worked out with the advisor. No specified number of pages is required.

Individual Research projects are to be completed within the course of one term. However, during the summer session if a student registers for MBA 595 for the first half of the session, a "P", In Progress, grade may be awarded and the project extended through the second session with faculty approval.

A student may not take MBA 595 until 15 program hours have been completed, including, if applicable the appropriate MBA core course in the field in which research is to be conducted.

It should also be noted that the course requires research, to be distinguished from individual study. There are no provisions in the program for a student to "self-study" a given subject.

## TRANSFER CREDIT

A maximum of six semester hours of appropriate graduate courses earned at another approved graduate school may be applied toward the MBA program

at the University of Dayton. No graduate credit earned at either the University of Dayton or another school may be applied to the MBA program if such course work was completed more than five years prior to the anticipated date of graduation.

In some cases, the credit will have been completed at another university prior to matriculation in the MBA program. To transfer this credit, a letter of request must be initiated by the student and sent to the MBA Office. Official transcripts must accompany the letter. The request should be initiated during the first term of enrollment. If approved, the credit will be transferred upon completion of 9.0 semester hours of U.D. MBA coursework in good academic standing. The course work must be of "B" quality or better. Quality points are not transferred.

In other cases, a student will leave the area before completing the program and will seek to transfer credit back in order to satisfy academic requirements off-campus. In these cases, the student must obtain approval for the proposed work before enrollment. The catalogue descriptions of the intended courses should be submitted to the MBA Office. Consultation with the MBA Office is also recommended. After course approval and completion, official transcripts are required. **A grade of "B" or better must be earned.**

## TIME LIMITATION

All course work, exclusive of surveys, must be completed within five calendar years of enrollment in the first core course.

## ACADEMIC STANDARDS

A student is expected to maintain a 3.0 average. Grades of all graduate courses, including Graduate Survey courses (500A-I) are included in the cumulative grade point average. A student whose average falls below 3.0 will receive a letter assigning Probationary Academic Status. The probation letter serves as an alert to the student that academic progress is not satisfactory and advises that a more concerted effort is required to achieve satisfactory standing. More than two "C" grades which are not offset by "A" grades provide a basis for academic evaluation and possible program suspension. If an "F" grade is received in a survey or core course, the student must repeat the course and achieve a passing grade. A 3.0 average must be attained and is required for graduation.

## FINANCIAL ASSISTANCE

### Graduate Assistantships

A limited number of graduate assistantships are available each year within the School of Business Administration. They are normally assigned to a department to assist in administration or research. Assistants contribute half-time services of 20 hours per week. Stipends are provided along with remission of tuition and fees plus other benefits available to university employees. Application forms are available in the M.B.A. office and may be submitted at any time.

## Dean's Fellowships

Each year a limited number of Dean's Fellowships are available, normally in the amount of \$500. To apply, the student submits a statement of approximately 1000 words emphasizing those factors which would support and merit the award of the fellowship. Criteria for the award include program qualifications, academic records, personal goals and objectives, and financial need. The statement should be submitted by April 1. Awards are made during April for the following fall term.

## OTHER ACADEMIC AWARDS

1. Each semester a "Certificate for Outstanding Academic Achievement" is awarded to those graduating students who have achieved a GPA of 3.8 or higher. The certificates are mailed to the students approximately one month following graduation.
2. The Reverend Raymond A. Roesch, S.M., Award of Excellence for outstanding academic achievement is awarded each April to the student who, during the preceding year of graduation, attained the highest academic record. The award consists of a plaque which is presented to the student plus an engraved plate displayed in the MBA office.
3. The School maintains a chapter of Beta Gamma Sigma, the National Scholastic Honor Society in the field of business and administration. Membership is earned through outstanding academic achievement. The top twenty percent of students awarded the master's degree are eligible. Induction occurs at a banquet in the Spring of each year.

## MBA — COLUMBUS PROGRAM

The MBA program is offered in Columbus, Ohio. Two locations are used, Franklin University and Otterbein College. A full complement of courses is normally scheduled at Franklin University in a given semester with the other half at Otterbein College. Courses are rotated between locations in the next semester, except for courses with heavy computer use which are scheduled only at Franklin. Thus, students can proceed with their degree work at a convenient location without interrupting a desired scheduling sequence. The courses are taught by the regular, full-time, doctorally qualified faculty of the School of Business Administration. The full range of support services to include computers and library holdings is available on site. The academic work leading to the degree is the same as that on the Dayton campus. The degree is awarded at commencement exercises held in Dayton.

## COURSES OF INSTRUCTION

**MBA 500A. GRADUATE SURVEY IN ECONOMICS:** Basic economic principles and their application. Consumer behavior, production theory, and the interaction of buyers and sellers in various kinds of markets. National income, monetary policy, fiscal policy and the economic role of the government in the United States. *3 sem. hrs.*

**MBA 500B. GRADUATE SURVEY IN ACCOUNTING:** The basic principles and concepts of accounting and financial statements are covered. Special emphasis is placed on understanding accounting terminology, conventions, and practices. *3 sem. hrs.*



**MBA 500C. GRADUATE SURVEY IN MARKETING:** Development of a framework within which the marketing process can be critically examined, including analysis of the societal and legal constraints of the marketing process. Introduction to a variety of concepts associated with the macro character of marketing including consumption systems, distribution systems, promotional activities, product development, and pricing.

*3 sem. hrs.*

**MBA 500D. GRADUATE SURVEY IN MANAGEMENT AND ORGANIZATIONAL BEHAVIOR:** The study of management thought and practice pertaining to individual and group behavior within organizations. Topics include organization theory and design, work design, group dynamics, leadership, motivation, interpersonal communications, and control.

*3 sem. hrs.*

**MBA 500E. GRADUATE SURVEY IN STATISTICS:** Applied statistics. Measures of central tendency and dispersion, frequency distributions, probability, sampling, hypothesis testing, analysis of variance, and simple and multiple regression analysis. Prerequisites: MBA 500G or equivalent and MBA 500I or equivalent.

*3 sem. hrs.*

**MBA 500F. GRADUATE SURVEY IN FINANCE:** An overview of finance to include the analysis of financial statements, valuation concepts, capital budgeting techniques, capital structure analysis, working capital management, and capital marketing financing instruments. Prerequisite: MBA 500B or equivalent.

*3 sem. hrs.*

**MBA 500G. GRADUATE SURVEY IN COMPUTER METHODS:** This course provides an overview of the role of computer systems in modern production and service organizations, the BASIC language, management information systems, and locally available computerized support.

*1 sem. hr.*

**MBA 500I. GRADUATE SURVEY IN QUANTITATIVE METHODS:** This course provides an overview of the role of mathematical methods in modern production and service organizations. The mathematical theories of simultaneous equations, matrices, differential calculus and integral calculus with applications to the management of production systems are included.

*2 sem. hrs.*

**MBA 501. MANAGERIAL ACCOUNTING:** Basic coverage of managerial accounting practices and techniques and of the concepts, principles and practices for internal reporting of financial data. Prerequisite: MBA 500B or equivalent.

*3 sem. hrs.*

**MBA 504. TAX FACTORS IN BUSINESS DECISIONS:** An examination of the provisions of the Federal Income Tax Code and tax laws on business decisions to include selection of the legal form of the business, acquisitions, mergers, employee compensation and benefits, alternative treatments of capital gains and ordinary income and interactions of income, estate, and gift taxes. Prerequisite: MBA 501.

*3 sem. hrs.*

**MBA 505. CONTEMPORARY ACCOUNTING ISSUES:** Seminar covering important or controversial accounting issues. The business and financial environment which underlies these issues, the alternative accounting techniques which are available or proposed, and their consequences are examined. Prerequisite: MBA 501.

*3 sem. hrs.*

**MBA 507. ACCOUNTING PLANNING AND CONTROL SYSTEMS:** A study of the accounting based information systems used by managers. Focuses on the provision for relevant accounting information to decision makers in a world of uncertainty, with cost-benefit considerations. Includes topics relevant to the controllership function. Prerequisite: MBA 501.

*3 sem. hrs.*

**MBA 510. QUANTITATIVE METHODS FOR BUSINESS DECISIONS:** Study of quantitative methods appropriate for decision support in an organizational setting. Cover topics such as linear programming, special and integer programming, decision theory, Markov analysis, queueing theory and simulation. Involves computer use. Prerequisites: MBA 500E or equivalent and MBA 500G or equivalent and MBA 500I or equivalent. *3 sem. hrs.*

**MBA 520. MANAGERIAL FINANCE:** Study of the theories, practices, instruments and markets relevant to financial management of business organizations. Emphasis is on analysis and decision-making with regard to the acquisition, employment, and financing of business assets consistent with organizational objectives. Prerequisites: MBA 500F or equivalent and MBA 501. *3 sem. hrs.*

**MBA 521. SPECIAL TOPICS IN MANAGERIAL FINANCE:** In-depth application of financial principles to selected areas. Topics vary. Emphasis may be on working capital management; capital budgeting; the capital asset pricing model; international finance; ratio analysis; or others. Prerequisite: MBA 520. *3 sem. hrs.*

**MBA 525. INVESTMENTS AND FINANCIAL MARKETS:** A study of investment principles and techniques used by both individual and institutional investors. Topics include bond and stock markets, security valuation methods, portfolio theory and management and investment institutions. Prerequisite: MBA 501 or MBA 520 or instructor's permission. *3 sem. hrs.*

**MBA 526. INTERNATIONAL FINANCIAL MANAGEMENT:** Integrates the international monetary environment with the multinational business firm and its operations. The course covers the analysis of balance of international payments and exchange rate determination. Specific international financial management topics include export-import financing, foreign direct investment, foreign exchange risk management, financial controls and international capital budgeting. Prerequisite: MBA 520. *3 sem. hrs.*

**MBA 530. MARKETING MANAGEMENT:** Examination of concepts, theories, facts and analytical procedures associated with marketing management. Market analysis; consumer behavior, competitor analysis, marketing information systems, marketing research and demand forecasting; marketing strategy; product, distribution, promotion and pricing decisions. Prerequisite: MBA 500C or equivalent. *3 sem. hrs.*

**MBA 535. RESEARCH FOR MARKETING DECISIONS:** Integrated overview of the functional areas of research design, data collection, data analysis and interpretation of findings, within the context of decision making for Marketing. Prerequisite: MBA 530. *3 sem. hrs.*

**MBA 536. SEMINAR IN INTERNATIONAL MARKET ANALYSIS:** Integration of concepts, theories and analytical procedures associated with market analysis of international markets. Topics include international trade concepts, analysis of export potential, analysis of the world marketing environment and international marketing management. Prerequisite: MBA 530. *3 sem. hrs.*

**MBA 537. LOGISTICS MANAGEMENT:** Examination of logistics systems using integrated management of transportation, warehousing, materials handling, packaging, inventory control, order processing and facility location. Examples include industrial, commercial and service organizations with various channel arrangements. Prerequisite: MBA 530. *3 sem. hrs.*

**MBA 540. MANAGERIAL ECONOMICS:** Examination of the scope and method of managerial methods in demand analysis, forecasting demand, short-run cost analysis; long-run costs and production functions; pricing, selected topics in pricing; risk and uncertainty. Analysis of macro-economic trends and their impact on the firm. Prerequisite: MBA 500A or equivalent, MBA 500E or equivalent, MBA 500G or equivalent and MBA 500I or equivalent. *3 sem. hrs.*

**MBA 541. LABOR RELATIONS AND LABOR ECONOMICS:** Collective bargaining, wage determination, structure and operation of labor markets, direction of the labor movement, theories of industrial peace and conflict; current problems and trends in labor relations. Prerequisite: MBA 500A or equivalent. *3 sem. hrs.*

**MBA 545. NATIONAL ECONOMIC POLICY AND FORECASTING:** A study of economic aggregates including employment, prices and income. Contemporary policy issues such as stagflation, wage and price controls, structural unemployment. Methods of forecasting economic aggregates. Prerequisite: MBA 500A or equivalent. *3 sem. hrs.*

**MBA 550. GOVERNMENT AND BUSINESS:** Analysis of government regulations and their impact on business. An examination of how business organizations when producing goods and services operate within the financial, legal and social constraints resulting from governmental activity. Prerequisite: MBA 500D or equivalent. *3 sem. hrs.*

**MBA 560. OPERATIONS MANAGEMENT:** An analysis of the management tasks of allocating the resources of a production or service system: facilities, equipment, time, and personnel. Topics include facility design, classical and modern inventory concepts, scheduling, quality, production standards, and others. Prerequisite: MBA 510. *3 sem. hrs.*

**MBA 563. MANAGEMENT INFORMATION SYSTEMS:** The course covers the basic concepts of general systems theory and computer systems. These concepts are applied to computer-based information systems. The issues involved in the management of information systems are addressed through discussion and analysis of extended MIS cases. Prerequisites: All survey courses or equivalent. *3 sem. hrs.*

**MBA 568. SPECIAL TOPICS IN DECISION SCIENCES:** Advanced and current topics in quantitative business analysis, production/operations management, or management information systems. Topics vary. Examples include statistical quality control, computer integrated manufacturing, decision support systems, and others. Prerequisite: MBA 510, 560, or 563 depending on the topic. *3 sem. hrs.*

**MBA 571. ORGANIZATIONS AND THEIR ENVIRONMENTS:** A study of the social, cultural, political and legal environments of organizations both profit and non-profit and of their impact on management at all levels. Emphasis is given to resultant problems and their resolution to include ethical considerations in the policy decision process. Prerequisite: MBA 500D or equivalent. *3 sem. hrs.*

**MBA 575. SEMINAR IN PERSONNEL AND INDUSTRIAL RELATIONS:** A study of the personnel and industrial relations function. An examination of employment planning and practices to include the legal framework and regulatory guidelines. Readings, exploratory research, experimental exercises, films and seminar discussions are the primary teaching methods. Prerequisite: MBA 500D or equivalent. *3 sem. hrs.*

**MBA 580. ORGANIZATION THEORY AND ANALYSIS:** Analysis of the components of an organization and the processes which integrate them into a functioning unit in pursuit of growth, stability, and ultimately survival. Emphasis is on modern organization theory. Extensive reading, exploratory research, and seminar discussions are integral aspects of the course. Prerequisite: MBA 500D or equivalent. 3 sem. hrs.

**MBA 584. INTERNATIONAL BUSINESS POLICY:** Changes in the structure, organization, and policies of multi-national business firms and international trade in general. Their implications relative to the composition of exports, international marketing processes, terms of trade and determinants of payments and exchange-rate movements. Prerequisite: MBA 500D or equivalent. 3 sem. hrs.

**MBA 586. INTERPERSONAL DYNAMICS IN ORGANIZATIONS:** The nature, types, formation and characteristics of groups that interact within an organization. Communication networks and organizational factors that influence interpersonal relationships and conflicts are discussed in depth. Lectures, outside reading, research, cases and group exercises. Prerequisite: MBA 500D or equivalent. 3 sem. hrs.

**MBA 587. ORGANIZATIONAL BEHAVIOR:** Individual behavior and interrelationships in an organization and management practices to promote organizational effectiveness. Basic psychological concepts such as motivation, leadership and the application of techniques for individual and organization growth. Lectures, reading, cases and problem-solving through group exercises. Prerequisite: MBA 500D or equivalent. 3 sem. hrs.

**MBA 588. SPECIAL TOPICS IN MANAGEMENT AND ORGANIZATIONAL BEHAVIOR:** Analysis and interpretation of research studies as applied to management. Coverage of issues such as leadership, interpersonal conflict resolution, resistance to change, managerial development, organizational growth, effects of technology, and emergence of new control systems. Role playing, small group exercises, and applications. Prerequisite: MBA 586 or MBA 587. 3 sem. hrs.

**MBA 589. SEMINAR IN STRATEGIC PLANNING:** Study of the Strategic Management processes in theory and practice using text, current literature, cases, and company studies. Class meetings will be primarily group discussion with some lectures by instructor and reports by students. Prerequisite: 21 semester hours of core courses. 3 sem. hrs.

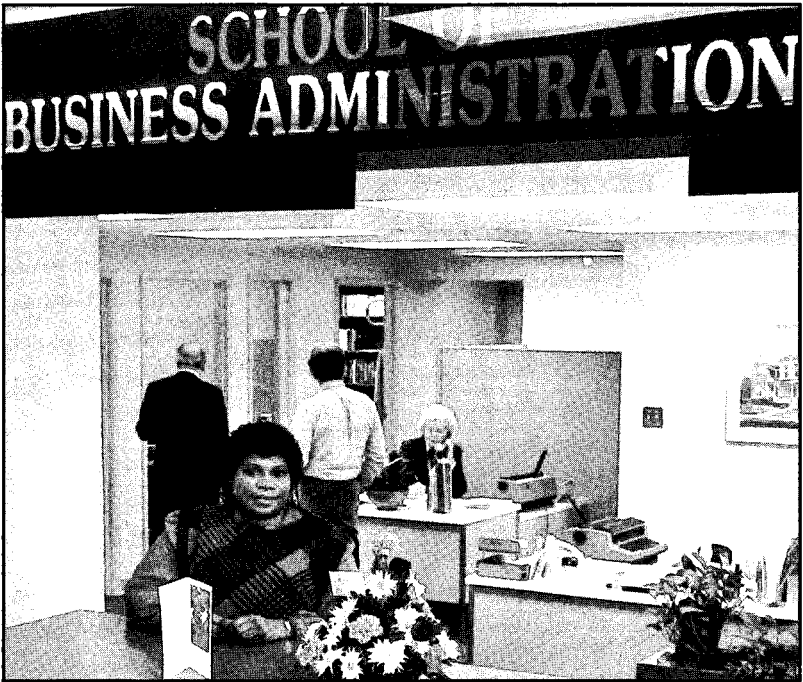
**MBA 590. BUSINESS POLICIES AND ADMINISTRATIVE MANAGEMENT:** The integration of theory and practice in the development of business policies. Emphasis is on the problems of executive management, decision-making and administrative action. Prerequisite: 21 semester hours of core courses. 3 sem. hrs.

**MBA 591. BUSINESS SIMULATION:** An integrative learning experience based on knowledge of the functional business areas and of the business environment. The course uses a computer simulation to examine the effect of students' management decisions over time. Lectures and small groups for decision-making reporting. Prerequisite: 21 semester hours of core courses. 3 sem. hrs.

**MBA 592. NEW VENTURE MANAGEMENT:** A study of entrepreneurship and the development of opportunities in new or renewed businesses. Focus is on identifying and analyzing business opportunities, locating and obtaining venture capital, development of a business plan, managing growth in the enterprise, and the decision making, risk taking, and leadership styles of entrepreneurs. Prerequisite: 21 semester hours of core courses. 3 sem. hrs.

**MBA 595. INDIVIDUAL RESEARCH:** Individual research in subjects encompassed by the M.B.A. curriculum under the guidance and direction of a faculty member. Research may be undertaken upon completion of 15 hours of core courses.

*1-3 sem. hrs.*



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## IX SCHOOL OF EDUCATION

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Ellis A. Joseph, Dean

Jerrold D. Hopfengardner, Associate Dean

The general objectives of the School of Education coincide with the purposes of the University. Accepting the Christian worldview as its distinctive orientation and seeking to foster principles and values consonant with a caring attitude, the School assists in carrying out the four essential tasks of the University: teaching, research, serving as a critic of society, and rendering public service. The particular objective of the School of Education is to develop those special capabilities of students which enable them to become effective practitioners in the field of professional education.

The School of Education programs leading to graduate degrees are designed primarily to meet the following purposes:

1. To develop advanced proficiency in elementary and secondary school teachers who have completed recognized baccalaureate teacher education programs.
2. To enable individuals to qualify for certification as principals, supervisors, and superintendents.
3. To prepare qualified school counselors, school psychologists, and counselors for social agencies.
4. To develop personnel for student services in higher education.
5. To prepare educational research specialists.
6. To enable students with nonprofessional education Baccalaureate degrees and above-average academic records to gain teacher certification.

The Master of Science in Education is the degree to which most of the graduate programs lead. The Master of Science in Teaching is also offered. The ED.S. degree in Educational Leadership may be earned. The awarding of these degrees means that the candidates have completed programs of graduate work designed to give them the following characteristics:

1. Broader knowledge of an advanced nature of the tested and untested psychological and philosophical theories of education.
2. Essential understandings and skills necessary for intelligent consumption of educational research.
3. More extensive knowledge and skill involved in teaching, or in school counseling, or in school administration.
4. Ability to contribute toward the improvement of school conditions and/or professional practice through consumer research.

The University of Dayton has traditionally given special consideration to those training for the education professions. In the spirit of this tradition, the Graduate School of Education changed from the semester-hour to the quarter-hour credit unit effective June 17, 1974. The quarter-hour credit system, within a trimester calendar, permits professional employed graduate students to begin and to finish courses and other program work at times and dates congruent with those of their other responsibilities. Students are encouraged to consult program directors and course schedules each term for details.

## **AUTHORIZATION**

The University of Dayton's offerings in graduate work leading to the Master of Science in Education have the official approval of the State of Ohio Department of Education and of the National Council for the Accreditation of Teacher Education.

## **ASSISTANTSHIPS**

The School of Education offers a limited number of assistantships. For information about these assistantships see the respective chairpersons of the departments in which the assistantships are sought.

## **ADMISSION**

### **General Requirements**

The School of Education accepts into its graduate programs applicants who can present undergraduate records showing them capable of meeting the standards of graduate work. An applicant (1) must hold a teacher's certificate and a bachelor's degree from an accredited institution (at least state and regional accreditation), unless specific exceptions are granted by the Dean of the School of Education; and (2) must have attained an undergraduate cumulative average of 2.5 or higher on a 4.0 scale. All applicants must submit three references from qualified professionals in appropriate fields.

An applicant who is not a graduate of the University of Dayton must submit complete official transcripts of all previous college studies. These transcripts should be sent directly to the Office for Graduate Studies, from the degree-granting institutions.

Admission to graduate study on regular, special, or conditional status does not imply admission to candidacy for a degree.

### **Special Requirements: School Psychologist Program**

Besides meeting the above requirements, an applicant for the School Psychologist Program must receive a favorable recommendation from the Department of Counselor Education and Human Services. In deciding whether or not to make such a recommendation, the faculty will take into account the applicant's physical and mental health, personality adjustment, and general character as determined by reference appraisals and other appropriate requirements which are in accordance with department policy.



### **Special Requirements: Master of Science in Teaching**

The program leading to the Master of Science in Teaching is restricted to the student who: (1) holds a bachelor's degree; (2) has an undergraduate cumulative point average of 2.5 or higher (on a 4.0 scale); (3) does not have a teaching certificate; (4) desires certification to teach; (5) has a major teaching field which can be serviced by graduate courses offered at the University of Dayton.

## **MASTER'S DEGREE PROGRAMS**

### **Advising**

The graduate student has access to three sources for official advisement:

1. The Office of the Dean of the School of Education serves as an initial advisory source for students regardless of the program they are following.
2. The chairpersons of the departments or the coordinators of the programs act as special advisors to students enrolled in programs under their jurisdiction. They counsel them with regard to their professional objectives, their selection of courses, and the options that are available in their programs. In the case of specialized programs within the department they may delegate these functions to the program directors. The student is urged to confer with the chairperson and/or director in the first term of enrollment.
3. The project or internship advisor, chosen by mutual agreement of the student, the departmental chairperson, and the prospective advisor, guides the student to the successful completion of the research project or the approved internship.

### **Candidacy**

A student becomes a candidate for the master's degree in Education if the cumulative point average for graduate work and the reference appraisals are judged to be acceptable. The most important consideration in the admission of a student to candidacy is the graduate work to date. Evidence of being able to meet all the graduation requirements must be given. Applicants who are deemed unqualified at this point will be advised to discontinue their programs.

Students should apply for admission to candidacy after the completion of approximately 20 quarter hours of graduate work, including at least two courses in the area of concentration and a research course required by their department. Application is made by filing the official candidacy form with the Dean. The applicants should be sure that all the required credentials are in order.

### **Academic Standing**

In order to qualify for graduation, a student must achieve a grade point average of at least 3.0 (B) in all work undertaken toward the degree.

### **Research Project or Internship Report**

At least ten days before graduation, the student must submit, according to the requirements of the specific program, three acceptable copies of the research



project and two copies of an abstract of the project; OR one acceptable copy of a formal report on the internship experience; OR, in the case of Plan C in the School Counseling program, one copy of the research paper.

### **Departmental Conference**

During the final term preceding graduation, the student must participate in a formal departmental conference as arranged by the appropriate departmental chairperson.

### **Employed Graduate Students**

The maximum course load permitted for any graduate student who is fully employed is nine quarter hours for the first and second terms and for the first half of the third term. Program directors may counsel fully-employed students to take less than nine hours. Adjustments to this policy are made on an individual basis in the cases of those not employed or partly-employed.

### **Workshop Credit**

No more than 8 quarter hours of workshop credit may be applied toward a degree.

### **Registration Dates For Courses At Off-Campus Sites**

Students taking graduate courses at off-campus sites of the School of Education should note that registration dates for courses at these sites are different from the registration date for courses taken at the University of Dayton campus.

All graduate credits in the School of Education are counted in quarter hours; conversion of these is made into semester hours when required.

## **JOINT PROGRAMS**

The Schools of Education and Law offer mature students the opportunity to earn the Master of Science in Education and the Juris Doctor. Prospective students must satisfy admission requirements for graduate work in the School of Education and for acceptance in the School of Law. See admission requirements of the Schools of Education and Law.

The School of Education in conjunction with the Department of Mathematics offers a Master of Science in Teaching degree with a concentration in mathematics. For information see the director of graduate studies in Education, or chairperson, Mathematics Department.

The School of Education and the College of Education, Wright State University, offer a two calendar-year program leading to the Educational Specialist degree in Education Leadership. See description in appropriate section.

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**Department of**

**COUNSELOR EDUCATION AND  
HUMAN SERVICES (EDC)**

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Eugene K. Moulin, Chairperson of the Department

The goals of the Department of Counselor Education and Human Services are:

1. To prepare elementary school counselors, secondary school counselors, student service personnel in higher education, school psychologists, school social workers, directors of pupil personnel services, guidance supervisors for state, county, and local systems, and counselors for community and other agency settings.
2. To provide teachers and other helping professionals with specific in-service course credit offerings designed to build skills and develop understandings relative to identified professional functions. These two missions are conducted at the University of Dayton campus, Steubenville, Lima, Springfield, Piqua, Bellaire, Cambridge, Bellefontaine, Columbus, Rio Grande, and other sites by invitation of local authorities.

The Department offers six emphases at the graduate level:

**School Counseling**

**School Social Worker**

**College Student Personnel Services**

**Social Agency Counseling I**

**Social Agency Counseling II**

**School Psychology**

Courses in counseling, personality, and vocational theories; principles and techniques of pupil services; individual and group counseling; psychometrics; individual personality evaluation; educational, occupational and social information; community resources; test administration and interpretation; organization, administration and program development of pupil and student services; professional, ethical, and legal responsibilities; evaluation of educational and organizational systems; and research methodology and statistics are applicable to departmental emphases. In addition, selected courses in behavioral and social science and other related disciplines lead to provisional certification as a school counselor, school social worker, and school psychologist; to Professional Counselor license and Professional Clinical Counselor license for social agency personnel.

The graduate program seeks to:

- (1) Build skills and develop human service specialists in assisting children, youth, and adults from varying socio-economic backgrounds.

Students are assisted in developing skills in counseling to conduct group process sessions with clients of various ages and learn when and how to utilize consultative services and social services available to children, youth, and adults.

Graduate students are assisted in integrating essential understandings out of which these skills and techniques can continue

to develop beyond their formal training. These understandings include those associated with the impact of family, poverty, and institutions on child and adolescent development, the nature of the learning process, the impact of the specific learning setting upon learning efficiency and upon the total development of the student. The department thus provides opportunity for activities to clarify values, increase self-awareness, and improve interpersonal skills.

- (2) Develop a method for conceptualizing the settings in which these skills are to be implemented.

Another set of activities is directed toward assisting graduate students to develop skills in examining school, community, government, and other institutional settings and in building models of those settings with particular emphasis upon factors significantly affecting children, youth, adults, teachers, administrators, and other professionals.

- (3) Allow the student to test and develop capacities for implementing these skills in practicum and internship experiences within new kinds of co-operating school and community agencies.

The unique perceptions and applications of techniques are the concern of the practical internships and field experience courses. The student's own style of implementation will be the focus of these activities, and through individualized supervision each student's system of performing many diverse professional duties will be tested.

## ADMISSION REQUIREMENTS

In addition to the general requirements of the School of Education, the Department of Counselor Education and Human Services requires that an applicant who has an undergraduate quality-point average below 2.5 of a possible 4.0 provide additional documentation in the form of an essay describing educational and other relevant achievements, and occupational goals.

## SCHOOL COUNSELING

### *General Requirements*

Plan A: 50 quarter credit hours

Research project, EDL 591 (4 qt. hrs.)

Report, Field Experiences course

Departmental Conference

Plan B: 50 quarter credit hours

Report, Field Experiences course

Departmental Conference

Plan C: 50 quarter credit hours

Paper, Research Methodology course, EDT 503 (4 qt. hrs.)

Report, Field Experiences course

Departmental Conference

**RECOMMENDED SEQUENCE OF COURSES****PREREQUISITES MARKED WITH ASTERISK***Quarter Hours***1. Guidance: Services, Personnel, Organization, Ethics, Law**  
(One Course Required)

EDC 522	Introduction to Guidance and Counseling .....	3
EDC 539	Administration of Pupil Personnel Services .....	3
EDC 580	Guidance in the Elementary School .....	3

**2. Social and Cultural Foundations** (One Course Required)

EDC 530	Psychology of Individual Differences .....	4
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**3. Human Development** (Two Courses Required)

EDC 531	Psychology of Personality Development .....	3
EDC 532	Learning Disabilities* .....	4
*Student certified in LD may take another Counseling course		

**4. Philosophy Of Education** (One Course Required)

EDT 502	Philosophical Studies in Education .....	4
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**5. Appraisal of the Individual** (One Course Required)

EDC 533	Psychometrics .....	3
EDC 534	Individual Psychological Evaluation of Exceptional Children .....	3
EDC 535	Test Interpretation and Case Studies .....	3

**6. Counseling Theories and Techniques of Counseling**  
(One Course Required)

EDC 543	Theories and Techniques of Counseling .....	4
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**7. Group Dynamics, Processing, Counseling** (One Course Required)

EDC 583	Theories and Techniques of Group Counseling .....	4
*Prerequisite: EDC 543		

**8. Lifestyles and Career Development** (One Course Required)

EDC 524	Educational and Occupational Information in Counseling	3
EDC 525	Community Resources in Counseling .....	3
EDC 528	Career Education .....	3
EDC 529	Psychology of Life Styles & Career Decision Making ....	3
EDC 655	Career Guidance Institute .....	3

**9. Research and Evaluation** (One Course Required)

EDA 513	Evaluation of Education and Organizational Systems...	4
EDT 503	Educational Research Methodology .....	4
*Prerequisites: EDC 524, EDC 533, EDC 543, EDC 583		

**10. Practicum & Field Experience** (Two Courses Required)

EDC 545	Practicum: Counseling Techniques .....	5
*Prerequisites: second last course before EDC 602 Advanced Review		
EDC 599	Field Experiences in Counseling .....	4
*Prerequisites: last course before EDC 602 Advanced Review		

**11. Preparation for State Dept. of Educ. School Counselor Certification Exam**

EDC 602	Seminar: Advanced Review .....	2
*Required preparation: last course after fulfilling all above course requirements for a master's degree.		

## SOME ELECTIVES

<b>Core Courses</b>	<b>Quarter Hours</b>
EDC 574 Independent Studies in Personnel Services .....	1-6
EDC 602 Counseling Seminars .....	1-6
EDC 635 Marriage & Family Counseling .....	4
Prerequisites: EDC 543, EDC 583	
EDC 501 Learning Theory and Education .....	4
EDC 504 Human Development and Education.....	4
EDC 578 Consultation in the Schools.....	4
Prerequisite: EDC 522 or EDC 580 or EDC 539	
EDC 581 Techniques of Child Counseling .....	3
Prerequisite: EDC 543 - recommended EDC 580	
EDC 673 Counseling Ethnic Minorities .....	3
Prerequisite: EDC 543 - recommended EDC 522 or EDC 580	

**Note:** In order to become a Certified School Counselor, a student must:

1. Be a certified teacher.
2. Have three (3) years of successful teaching experience.
3. Have completed a minimum of 45 graduate quarter credit hours in strictly Counseling courses which cover the ten areas decreed by the State.
4. Have taken EDC 602 Seminar: Advanced Review (2 quarter hours).
5. Have a master's degree.
6. Be recommended by the Dean of the School of Education to take the Ohio State Department of Education competency exam for State Counselor Certification.
7. Achieve success in the State Department of Education exam.
8. Apply for School Certification to the State Department of Education through the Dean of Education Office. Be recommended by the Dean.

**Note:** A student who is accepted as a graduate student on conditional/regular status for school counseling program in an official letter, dated on or before July 1, 1987, from the Dean of the School of Education of the University of Dayton, may follow the requirements mandated in 1972 with a few addenda through the years. Such student must fulfill all the old requirements on or before July 1, 1991.

**Note:** If a student wishes to be a Professional Licensed Counselor (PLC), a student must:

1. Take all the required courses as specified in Social Agency Counseling Program II.
2. Have completed a total of sixty (60) quarter hours, in all Counseling courses spread over the areas specified by the State Board for Licensing Professional Counselors. Please see areas under Social Agency Counseling Program II.
3. Meet the requirements for supervised experience in counseling required by and approved before hand by the State Board for Licensing.
4. Achieve success in the competency exam given by the State of Ohio Licensing Board.

**Note:** If a student wishes to be a Professional Licensed Clinical Counselor (PLCC), a student must fulfill all requirements as specified under Social Agency Counseling Program II.

**SCHOOL SOCIAL WORKER**

***General Requirements***

50 quarter credit hours  
Report, Field Experiences in School Social Work, EDC  
653  
Departmental Conference

**RECOMMENDED SEQUENCE OF COURSES**

PREREQUISITES MARKED WITH ASTERISK	<i>Quarter Hours</i>
<b>1. Guidance: Services, Personnel, Organization, Ethics, Law</b> (One Course Required)	
EDC 522 Introduction to Guidance and Counseling .....	3
EDC 539 Administration of Pupil Personnel Services .....	3
<b>2. Human Growth and Development</b> (Two Courses Required)	
EDC 531 Psychology of Personality Development .....	3
OR	
EDT 504 Human Development in Education .....	4
EDC 532 Learning Disabilities .....	4
*Student certified in LD may take another Counseling course.	
<b>3. Educational Psychology</b> (One Course Required)	
EDC 530 Psychology of Individual Differences .....	4
<b>4. Testing and Measurements</b> (One Course Required)	
EDC 533 Psychometrics .....	3
EDC 535 Test Interpretations and Case Studies .....	3
<b>5. Counseling Theories and Techniques</b> (One Course Required)	
EDC 543 Theories and Techniques of Counseling .....	4
<b>6. CORE: Philosopohy, Evaluation, Research</b> (Two Courses Required)	
EDT 502 Philosophical Studies in Education REQUIRED .....	4
EDC 503 Educational Research Methodology .....	4*
OR	
EDA 513 Evaluation of Educational and Organizational Systems ...	4*
*Prerequisites: EDC 524, EDC 533, EDC 543, EDC 583	
<b>7. School and Community Resources</b> (One Course Required)	
EDC 525 Community Resources in Counseling .....	3
<b>8. Family Counseling</b> (One Course Required)	
EDC 635 Marriage and Family Counseling .....	4*
*Prerequisite: EDC 543	
<b>9. Juvenile Delinquencies: Policies, Procedures, Practice</b> (One Course Required)	
EDC 602 Delinquents and Juvenile Court .....	2
<b>10. Practicum</b> (One Course Required)	
EDC 653 Field Experiences in Social Work .....	5*
*Prerequisites: last course to be taken	

SOME ELECTIVES

	<i>Quarter Hours</i>
EDC 574 Independent Studies in Personnel Services .....	1-6
EDC 583 Theories and Techniques of Group Counseling .....	4
Prerequisite: EDC 543 or EDC 581	
EDC 581 Techniques of Child Counseling .....	3
Prerequisite: EDC 543	
EDC 602 Youth Suicide .....	1
EDC 602 Drug and Alcohol Abuse .....	1
EDC 602 Runaways .....	1
EDC 602 Children of Divorce .....	1
EDC 602 Eating Disorders .....	1
EDC 602 Teenage Pregnancy .....	1
EDC 602 Crisis Counseling .....	1
EDC 602 Counseling the Single Parent Family .....	3
EDC 602 Multicultural Counseling .....	1
EDC 602 Child Abuse .....	1
EDC 602 Identification of the Gifted .....	1
EDC 602 Student Stress .....	1
EDC 602 Surviving the Students .....	1
EDC 602 Building Self-Esteem .....	1-6
EDC 602 Value clarification .....	1
EDC 673 Counseling Ethnic Minorities .....	3

COLLEGE STUDENT PERSONNEL SERVICES

*General Requirements*

50 quarter credit hours  
Reports, Internships, EDC 553  
Departmental Conference

PROGRAM FOR FULL-TIME STUDENTS AND FOR STAFF  
MEMBERS OF COLLEGE STUDENT PERSONNEL SERVICES

RECOMMENDED SEQUENCE OF COURSES

	<i>Quarter Hours</i>
PREREQUISITES MARKED WITH ASTERISK	
1. <b>Human Development</b> (One Course Required)	
EDC 530 Psychology of Individual Differences .....	4
EDC 531 Psychology of Personality Development .....	3
EDC 504 Human Development in Education .....	4
2. <b>Philosophy of Education</b> (One Course Required)	
EDT 502 Philosophical Studies in Education .....	4
3. <b>General Administration, Trends, Ethics, Law of College Personnel Services</b> (One Course Required)	
EDC 551 College Student Personnel Services .....	3

4. <b>History of American Colleges/Universities</b> (One Course Required)	
EDT 512 History of Higher Education in U.S. ....	4
5. <b>Appraisal of Individual</b> (One Course Required)	
EDC 533 Psychometrics .....	3
6. <b>Life Styles and Career Development</b> (One Course Required)	
EDC 524 Educational and Occupational Information .....	3
EDC 529 Psychology of Life Styles and Career Decision Making...	3
7. <b>Theories of Counseling, Techniques</b> (One Course Required)	
EDC 543 Theories and Techniques of Counseling .....	4
8. <b>Group Dynamics, Process</b> (One Course Required)	
EDC 583 Theories and Techniques of Group Counseling .....	4
*Prerequisite: EDC 543	
9. <b>Research, Statistics, Evaluation</b> (One Course Required)	
EDA 513 Evaluation of Educational and Organizational Systems...	4
EDC 503 Educational Research Methodology .....	4
*Prerequisites: EDC 524, 529, 533, 543, 583	
10. <b>Practicum</b> (One Course Required)	
EDC 545 Practicum: Counseling Techniques .....	5
*Prerequisites: all required Counseling courses	
11. <b>Internships in College Student Personnel Services</b> (Three Internships Required)	
EDC 553 Internships in College Student Personnel Services .....	9
(Usually first internship will be taken during student's second trimester at U.D.) (Three internships, 3 credit hours each, one internship per trimester)	

**Notes:** *Students in Business, Engineering and other fields may take this program.*  
*Internships must be taken during the regular office hours of the services, usually mornings and early afternoons. Summer internships start in May.*  
*Courses EDC 551 and EDT 512 are not given during the summer.*  
*Internships may be taken at other colleges/universities with approval of the advisor.*  
*Some internships: Placement, Co-op Education, Adult Education, Admissions, Financial Aid, University Activities, Housing, Residence Life, etc.*

**SOME ELECTIVES**

**Quarter Hours**  
EDC 620 Seminars, EDC 673 Counseling Ethinc Minorities, etc.3-5 qtr. hrs.

**SOCIAL AGENCY COUNSELING I**  
**(Human Resources Counseling)**

**FOR CLERGY, LAY PASTORAL MINISTERS, NURSES, BUSINESS PERSONNEL, AND OTHERS NOT SEEKING STATE LICENSING**



*General Requirements*

45 quarter credit hours  
Report, Field Experiences, EDC 598  
Departmental Conference

**RECOMMENDED SEQUENCE OF COURSES**

PREREQUISITES MARKED WITH ASTERISK *Quarter Hours*

- 1. **Human Development** (One Course Required)
  - EDC 530 Psychology of Individual Differences . . . . . 4
  - EDC 531 Psychology of Personality Development . . . . . 3
- 2. **Professional Responsibilities, Ethical and Legal Aspects, Foundations Thereof** (One Course Required)
  - EDC 544 Professional Ethical and Legal Responsibilities . . . . . 3
- 3. **Life Styles and Career Development** (One Course Required)
  - EDC 524 Educational and Occupational Information in Counseling 3
  - EDC 525 Community Resources in Counseling . . . . . 3
  - EDC 529 Psychology of Life Styles and Career Decision Making . . . 3
- 4. **Counseling Theory, Counseling Techniques** (One Course Required)
  - EDT 543 Theories and Techniques of Counseling . . . . . 4
- 5. **Group Dynamics, Processing, Counseling** (One Course Required)
  - EDC 583 Theories and Techniques of Group Counseling . . . . . 4
  - \*Prerequisite: EDC 543
- 6. **Research and Evaluation** (One Course Required)
  - EDT 503 Educational Research Methodology . . . . . 4
  - EDC 513 Evaluation of Educational and Organizational Systems . . . 4
  - \*Prerequisites: EDC 525, EDC 543, EDC 583
- 7. **Supervised Practicum** (One Course Required)
  - EDC 545 Practicum: Counseling Techniques . . . . . 5
  - \*Prerequisites: *second last course* to be taken for the degree
- 8. **Field Experiences** (One Course Required)
  - EDC 598 Field Experiences in Social Agencies Counseling . . . . . 4
  - \*Prerequisite: *last course* to be taken for the degree

**ELECTIVES MAY BE TAKEN FROM ONE OR SEVERAL OF THE FOLLOWING AREAS OF STUDY**

**ELECTIVES, EXCEPTIONAL CHILDREN COUNSELING**

- EDC 532 Learning Disabilities . . . . . 4
- EDC 534 Individual Psychological Evaluation of  
Exceptional Children . . . . . 4
- EDT 576 Teaching the Gifted and Talented . . . . . 4\*
- EDT 580 Psychology and Education of the Retarded . . . . . 4\*
- EDC 587 Career Development — Special Education . . . . . 4\*
- EDC 602 Identification of the Gifted

- EDC 602 Development of the Gifted .....  
 \*For information about EDT 576, EDT 580, and EDT 587 contact  
 Dr. Roger Carlson (Chaminade Hall 216B) or Dr. Roberta Weaver  
 (Chaminade Hall 216A)

### ELECTIVES, FAMILY COUNSELING

- |         |                                      |  |
|---------|--------------------------------------|--|
| EDC 581 | Techniques in Child Counseling ..... | 3  |
| EDC 525 | Community Resources .....            | 3  |
| EDC 635 | Marriage and Family Counseling ..... | 4  |
| EDC 602 | Seminars:                            |  |
|         | Child Abuse                          | Impact of Poverty<br>on the Family         |
|         | Runaways                             | Building Self-Esteem                       |
|         | Counseling Single Parent<br>Families | Values Clarification<br>Stress<br>Runaways |

### ELECTIVES, JUVENILE DELINQUENT COUNSELING

- |         |   |   |
|---------|---|---|
| EDC 530 | Psychology of Individual Differences .....  | 4   |
| EDC 531 | Psychology of Personality Development ..... | 3   |
| EDT 581 | Techniques in Child Counseling .....        | 3   |
| EDT 673 | Counseling Ethnic Minorities .....          | 3   |
| EDC 602 | Seminars:                                   |   |
|         | Delinquents and<br>Juvenile Court (2)       | Teen Pregnancy<br>Eating Disorders        |
|         | Counseling Single<br>Parent Families        | Building Self-Esteem<br>Crisis Counseling |
|         | Runaways                                    | Multi-Cultural                            |
|         | Alcohol & Drug Abuse                        | Classroom Guidance                        |
|         | Student Stress                              | Impact of Poverty                         |
|         | Marriage and Family<br>Counseling (4)       |   |

### ELECTIVES, MENTAL HEALTH COUNSELING

#### Core Courses

#### Quarter Hours

- |         |   |                                 |
|---------|---|---------------------------------|
| EDC 530 | Psychology of Individual Differences .....  | 4                               |
| EDC 531 | Psychology of Personality Development ..... | 3                               |
| EDC 635 | Marriage and Family Counseling .....        | 4                               |
| EDC 673 | Counseling Ethnic Minorities .....          | 3                               |
| EDC 602 | Seminars:                                   |                                 |
|         | Alcohol & Drug Abuse                        | Eating Disorders                |
|         | Stress                                      | Crisis Counseling               |
|         | Counseling Single<br>Parent Families        | Mental Health<br>Stages of Life |
|         | Child Abuse                                 | Value Clarification             |
|         | Suicide Prevention                          | Teen Pregnancy                  |

**ELECTIVES MAY BE TAKEN FROM ONE OR SEVERAL OF THE FOLLOWING AREAS OF STUDY**

**ELECTIVES, CAREER COUNSELING**

EDC 524	Educational and Occupational Information in Counseling .....	3
EDC 525	Community Resources in Counseling .....	3
EDC 528	Career Education .....	3
EDC 529	Life Styles and Career Decision Making .....	3
EDC 655	Career Guidance Institute .....	3
EDT 587	Career Development — Special Education .....	4*
*For information, contact Dr. Roger Carlson or Dr. Roberta Weaver		

**ELECTIVES, BUSINESS AND INDUSTRIAL COUNSELING**

MBA 500D	Graduate Seminar in Management (3 semester hours)*	<i>Quarter Hours</i>
MBA 586	Interpersonal Dynamics in Organizations (3 semester hours)*	
MBA 587	Organizational Behavior (3 semester hours)*	
MBA 575	Seminar in Personnel and Industrial Relations (3 semester hours)*	

\*Please check Course Bulletin of term for MBA credit cost.  
\*MBA 500D is required for MBA 586, 587 and 575.  
\*After registration for an MBA course has been approved by the director of the Social Agencies Counseling Program of the Counselor Education Department, the student must go to Dr. Henry Stick, Director of the MBA Program (Miriam Hall, room 230), for final approval. The student may not just mail the registration without the necessary signatures.

**ELECTIVES, GERIATRIC COUNSELING**

EDC 602	Seminar: Death, Dying: Grief Process	
EDC 602	Seminar: Dynamics of Gerontological Counseling	
REL 575	Pastoral Counseling (3 semester hours)*	

\*Please check Course Bulletin of term for Religious Studies Department credit cost.  
\*After registration of REL 575 has been approved by advisor of Counselor Education Department, the student must go to Rev. James L. Heft, S.M., director of Graduate Religious Studies (Zehler Hall, room 211), for final approval. The student may not just mail the registration without the necessary signatures.

**SCHOOL AGENCY COUNSELING II****(Leading to Ohio Licensure in Professional Counseling)****General Requirements**

60 quarter credit hours  
 Report, Field Experiences, EDC 598  
 Departmental Conference

**RECOMMENDED SEQUENCE OF COURSES****PREREQUISITES MARKED WITH ASTERISK***Quarter Hours*

1. **Human Development** (One Course Required)  
 EDC 531 Psychology of Personality Development ..... 3
2. **Social and Cultural Foundations of Counseling**  
 (One Course Required)  
 EDC 530 Psychology of Individual Differences ..... 4
3. **Foundations of Professional Responsibilities, Ethics and Legal Aspects** (One Course Required)  
 # EDC 544 Professional, Legal and Ethical Responsibilities ..... 3
4. **Appraisal of the Individual** (Two Courses Required)  
 EDC 533 Psychometrics ..... 3  
 EDC 535 Test Interpretations and Case Studies ..... 3  
 # EDC 602 Counseling Seminar: Diagnosis and Treatment  
 Planning in Counseling (3) REQUIRED
5. **Life Style and Career Development** (One Course Required)  
 # EDC 529 Psychology of Life Styles and Career Decision Making ... 3
6. **Counseling Theory, Counseling Techniques** (One Course Required)  
 EDT 543 Theories and Techniques of Counseling ..... 4
7. **Group Dynamics, Processing, Counseling** (One Course Required)  
 EDC 583 Theories and Techniques of Group Counseling ..... 4  
 \*Prerequisite: EDC 543
8. **Research and Evaluation** (One Course Required)  
 EDA 513 Evaluation of Educational and Organizational Systems ... 4  
 EDT 503 Educational Research Methodology ..... 4  
 \*Prerequisite: EDC 529, EDC 533 or 535, EDC 543, EDC 583
9. **Supervised Practicum** (Two Courses Required)  
 EDC 545 Practicum: Counseling Techniques ..... 5  
 \*Prerequisite: *third last course to be taken for the degree*  
 # EDC 584 Practicum: Group Counseling ..... 4  
 \*Prerequisite: EDC 583 Theories and Techniques of  
 Group Counseling ..... 4
10. **Field Experiences** (One Course Required)  
 EDC 598 Field Experiences in Social Agencies ..... 4  
 \*Prerequisite: course must be taken in the student's last term
11. **Culminating Seminar** (One Course Required)  
 EDC 602 Seminar: Preparation for the State of Ohio Licensed Professional  
 Counselor Exam (2)  
 # Indicates courses which are available only at the Dayton and Capital Centers.

## **ELECTIVES - MAY BE TAKEN FROM THE REMAINING EDC COURSES ABOVE OR FROM THE COURSES LISTED BELOW**

### *Quarter Hours*

EDC 524	Educational and Occupational Information in Counseling .....	3
EDC 525	Community Resources in Counseling .....	3
EDC 528	Career Education .....	3
EDC 532	Learning Disabilities .....	4
EDC 534	Individual Psychological Evaluation of Exceptional Children .....	3
EDC 574	Independent Study in Personnel Services .....	1-6
EDC 581	Techniques of Child Counseling .....	3
EDC 635	Marriage and Family Counseling .....	4
EDC 573	Counseling Ethnic Minorities .....	3
EDC 602	Counseling Seminars .....	1-3
	Youth Suicide, Teen Pregnancy, Alcohol and Drug Abuse, Child Abuse, Children of Divorce, Eating Disorders, Runaways, Building Self-Esteem, Crisis Counseling, Value Clarification, The Impact of Poverty on the Family	

## **IN ORDER TO OBTAIN THE LICENSE IN PROFESSIONAL COUNSELING, THE STUDENT MUST:**

1. Fulfill all the above requirements for the master's degree in counseling.
2. Meet the requirements for supervised experience in counseling as required by the State of Ohio Board for Licensing of Counselor, Social Worker, Mental Health Workers.
3. Pass the State competency exam required by the State Board for licensing.

\* The list of mental health courses required for the license in professional clinical counseling will be issued in the fall, 1987.

## **SCHOOL PSYCHOLOGY**

### *Quarter Hours*

### **I. Psychological Foundation (19 hours)**

#### **A. Cultural Diversity and Human Exceptionalities**

- \* EDT 590 Introduction to Exceptionalities OR ..... \*4
- EDT 580 Psychology and Education of the Retarded OR ... 4 (a)
- EDT 575 Study of Gifted and Talented Students ..... 4 (b)

#### **B. Human Learning**

- \* EDT 501 Learn Theory and Education OR ..... \*4
- PSY 522 Advanced Cognitive Processes ..... 4

#### **C. Normal and Abnormal Child and Adolescent Development**

- \* EDT 504 Human Development and Education OR ..... \*4
- PSY 573 Developmental Psychology ..... 4
- \* EDC 531 Psychology of Person and Development ..... \*3
- PSY 555 Theory of Personality and Psychotherapy ..... 4

*Quarter Hours*

- D. Biological and Social Bases of Behavior
  - \* EDC 530 Psychology of Individual Differences ..... \*4
- E. Emotional Bases of Behavior (See EDC 531, above.)
- II. Educational Foundations (11 or 17 hours)**
  - F. Educational Philosophy
    - \* EDT 502 Philosophical Studies in Education ..... \*4
  - G. Curriculum and Instructional Techniques
    - EDA 511 Curriculum ..... \*4(c)
  - H. Education of Exceptional Learners
    - \* EDT 593 Education of Students with Learning and Behavioral Disorders ..... \*4
    - EDC 532 Learning Disabilities ..... 4
    - EDT 589 Education of the Multi-Handicapped ..... 3(a)
    - EDT 576 Teaching the Gifted and Talented ..... 4(b)
  - I. Organization and Operation of Schools
    - \* EDC 539 Administration of Pupil Personnel Services ..... \*3
  - J. Field Based Experiences
    - EDC 573 Orientation to the Educational Process ..... 2(c)
- III. Assessment and Intervention (40 hours)**
  - K. Diagnosis and Remediation of Basic Academic Areas
    - \* EDT 594 Diagnostic Teaching in LD/BD ..... \*4
    - EDT 592 Curr Mat and Instr Procd for Teach MR ..... 6(a)
    - EDT 578 Special Topics in Gifted Education ..... 4(b)
  - L. Psycho-Educational Assessment
    - \* EDC 576 Individual Cognitive Assessment ..... \*4
    - EDC 534 Individual Psychological Evaluation of Exceptional Children ..... \*4
    - EDC 577 Individual Behavior and Personality Assessment . \*4
  - M. Behavior Management
    - \* EDT 596 Classroom Structure and Behavior Management .. \*4
  - N. Consultation and Interview Techniques
    - \* EDC 578 Consultation in the Schools ..... \*4
  - O. Counseling Theory and Practice
    - \* EDC 543 Counseling Theories and Techniques ..... \*4
    - EDC 545 Practicum: Counseling Techniques ..... \*4
    - \* EDT 583 Theories and Techniques of Group Counseling ... \*4
  - P. Practicum
    - \* EDC 579 Practicum: Individual Assessment and Intervention \*3
- IV. Statistics and Research Design (8 hours)**
  - Q. Statistics
    - \* EDT 638 Educational Statistics ..... \*4
  - R. Research Design
    - \* EDT 503 Educational Research Methodology OR ..... \*4
    - EDA 513 Evaluation of Educational and Organizational Systems 4

Quarter Hours

V. School of Psychology Foundation (4 hours)

- S. History of School Psychology ..... (4 hours)
- T. Legal and Ethical Issues, and Professional Standards
- U. Roles and Functions of School Psychologists
  - \* EDC 572 Role and Function of the School Psychologist ..... \*4

VI. Internship (12 hours)

- \* EDC 594 Internship in School Psychology ..... \*6
- EDC 595 Internship in School Psychology ..... 6
- Total: \*94

\* Required for students with regular (elementary or secondary) classroom teaching certification, who do not have graduate coursework in any of the above areas, and who do not have special education or school counseling certification.

(a) Required for students who have LD/BD certification, but who do not have graduate coursework in any of the above areas.

(b) Required for students who have MR certification, but who do not have graduate coursework in any of the above areas.

(c) Required for students who do not hold a valid Ohio teaching certificate, in addition to all courses showing an\*.

SCHEDULE FOR SCHOOL PSYCHOLOGY COURSEWORK\*

		T	E	R	M		
		I	II	III-1	III-2		
Y  E  A  R	1	EDT 504 (4) EDT 590 (4)	EDT 501 (4) EDT 593 (4)	EDC 531 (3) EDC 572 (2)	EDT 503 (4) EDC 530 (4) EDC 543 (4)	33 hrs.	
	2	EDT 502 (4) EDT 638 (4)	EDC 583 (4) EDT 594 (4)	EDT 596 (4) EDC 539 (3) a	EDC 576 (4) d  b	27 hrs.	
	3	EDC 534 (4) d EDC 572 (2)	EDC 545 (5) EDC 577 (4) d	EDC 579 (3) d	EDC 578 (4)	22 hrs.	
	4	EDC 594 (6)	EDC 595 (6)		c	12 hrs.	94 hrs.

\* Required for students with regular (elementary or secondary) classroom teaching certification, who do not have graduate coursework in any of the above areas, and who do not have special education or school counseling certification.

a. Student applies for M.S. candidacy.

b. Student eligible for M.S. degree.

c. Student eligible for Ohio 4-year provisional certificate in school psychology.

d. These three courses are offered at Wright State University on alternate years.

## SCHOOL PSYCHOLOGY PROGRAM NOTES

1. In addition to the admission criteria described elsewhere in this brochure and in the graduate bulletin (positive references and undergraduate grade point average of at least 2.5), applicants will be required to take the Miller Analogies Test, to submit a typewritten statement of their interest in and current perception of the role of the school psychologist, and to participate in interviews with department faculty.
2. Students must hold either a valid Ohio teaching certificate or a degree in psychology in order to apply to the school psychology program.
3. This program has been developed in accordance with training standards adopted by the National Association of School Psychologists (1984) and Ohio certification standards effective July 1, 1987.

## COURSES OF INSTRUCTION

EDC 522. INTRODUCTION TO GUIDANCE: Concepts and techniques for teachers and counselors discussed within the framework of the essential guidance services. Emphasis on today's child and adolescent; developmental approach; problem situations; theories for understanding child behavior; basic guidance services; roles and responsibilities of personnel; cross-cultural counseling; consulting with parents, teachers, and administrators; procedures for case study; referrals; ethical and legal aspects; issues and trends.  
3 qtr. hrs.

EDC 524. EDUCATIONAL AND OCCUPATIONAL INFORMATION: Selection, utilization, and evaluation of educational and occupational information materials; familiarization with standard labor market data, current requirements for admission into college curricula, and available sources of placement; printed and personal reference sources in these fields.  
3 qtr. hrs.

EDC 525. COMMUNITY RESOURCES: Familiarization with availability of services in appraisal, guidance; local information and placement (medical, pastoral, social welfare, mental, educational, industrial, labor, commercial, governmental, and recreational agencies).  
3 qtr. hrs.

EDC 528. CAREER EDUCATION: Assistance for teachers, counselors, administrators and social agency personnel in improving their career education functions through a coordinated and concentrated effort of occupational guidance integrated within the total elementary and secondary school curriculum; and in increasing their educational vocational self-awareness and value clarity as they are related to career development.  
3 qtr. hrs.

EDC 529. PSYCHOLOGY OF LIFE STYLE AND CAREER DECISION-MAKING: Designed to provide the student with knowledge, skills, attitudes, and values related to a variety of life styles and the process of career decision-making. This process takes into consideration an individual's experiential past, present, and preferred life style, and the development of career goals consistent with that preferred life style.  
3 qtr. hrs.

EDC 530. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES: Nature, extent, and significance of variability; hereditary and cultural influences; theories of intelligence; trait organization; group differences.  
4 qtr. hrs.

EDC 531. PSYCHOLOGY OF PERSONALITY DEVELOPMENT: Personality theory and abnormal psychology are discussed with emphasis on dynamics of personal behavior.  
3 qtr. hrs.



**EDC 532. LEARNING DISABILITIES:** Etiological, diagnostic, theoretical, and remedial factors and practical application to learning disabilities; procedures for the implementation of Public Law 94-142 and House Bill 455. *4 qtr. hrs.*

**EDC 533. PSYCHOMETRICS:** Lectures and demonstrations in the principles and application of psychological measurement, with emphasis on standardized group tests of intelligence and scholastic achievement, interest tests, personality tests, etc. Practicum in test selection, use, and interpretation. *3 qtr. hrs.*

**EDC 534. INDIVIDUAL PSYCHOLOGICAL EVALUATION OF EXCEPTIONAL CHILDREN:** An overview of the various classifications of handicapped children and the role that psycho-educational assessment plays in the classification of such children. Principally for counselors and teachers. Special section in second term for school psychologists provides laboratory training in the use of assessment instruments with handicapped children. *4 qtr. hrs.*

**EDC 535. TEST INTERPRETATIONS AND CASE STUDIES:** Experience and lecture in case studies: constituents of study; philosophy; criteria for collecting data; observation techniques, analysis through group role devices, client-participatory non-test assessment techniques, tests; principles of writing, evaluative criteria. In testing: test concepts, statistics, analysis, uses, communication, ethics. *3 qtr. hrs.*

**EDC 536. CLASSROOM EDUCATION OF PROBLEM CHILDREN:** To assist teachers, counselors, and administrators to understand more fully and to improve their function as educators of "children in conflict." Consulting specialists work with participants to explore techniques, approaches, and school and community programs which respond to the academic and personal needs of children with problems. *3 qtr. hrs.*

**EDC 539. ADMINISTRATION OF PUPIL PERSONNEL SERVICES:** The effective planning, developing, and administering of a totally balanced and co-ordinated program of pupil personnel services. *3 qtr. hrs.*

**EDC 543. COUNSELING THEORIES AND TECHNIQUES:** Development of skills in counseling through an analysis of five models (relationship, behavioral, social-psychological, reality model, and rational-cognitive) for the behavior change process. An integrated approach for modifying the behavior of children and adults through individual and system change. *4 qtr. hrs.*

**EDC 544. PROFESSIONAL, ETHICAL, AND LEGAL RESPONSIBILITIES:** Study of the philosophical assumptions of the various theories of counseling and psychotherapy. Treatment of counseling ethics and professional practices; laws and court decisions pertaining to counseling. *3 qtr. hrs.*

**EDC 545. PRACTICUM: COUNSELING TECHNIQUES:** Supervised experience in counseling. Both group and individualized instruction and supervision. Last course for master's degree. *5 qtr. hrs.*

**EDC 551. PERSONNEL SERVICES IN HIGHER EDUCATION:** A study of personnel services in higher education; theory and practice of administration, trends and research. *3 qtr. hrs.*

**EDC 552. SEMINAR: COLLEGE PERSONNEL SERVICE PROBLEMS:** Problems encountered during the internship and present-day problems of campus life. *2 qtr. hrs.*

EDC 553. INTERNSHIP IN COLLEGE PERSONNEL SERVICES: A three-trimester experience in three college personnel services under the instruction and supervision of staff members of the same services working closely with the coordinator of College Personnel Work. Given in blocks of 3 quarter hours each over three terms.

9 qtr. hrs.

EDC 572. ROLE AND FUNCTION OF SCHOOL PSYCHOLOGIST: Topics of significance in the profession of school psychology, with emphasis on history and foundations of school psychology, legal and ethical issues, professional issues and standards, and roles and functions of the school psychologist. Research paper required.

4 qtr. hrs.

EDC 573. ORIENTATION TO THE EDUCATIONAL PROCESS: Directed observation of and participation in the usual school process under supervision within the school. Required of all school psychology candidates who do not have teaching certificates.

2-6 qtr. hrs.

EDC 574. INDEPENDENT STUDIES IN PERSONNEL SERVICES: Independent study undertaken with permission of the chairperson.

1-6 qtr. hrs.

EDC 576. INDIVIDUAL COGNITIVE ASSESSMENT: Evaluation and interpretation of intelligence tests. Intensive experience in administering the Wechsler tests, Stanford-Binet test, individual achievement tests, and other appropriate tests used in multi-factor assessment according to Public Law 94-142 and House Bill 455. (Course limited to those students in Psychology programs.)

4 qtr. hrs.

EDC 577. INDIVIDUAL BEHAVIORAL AND PERSONALITY ASSESSMENT: Evaluation and interpretation of projective tests. Instruction in the administration and use of the tests commonly used by the psychologist, and which may be included in the multi-factor analysis required by Public Law 94-142 and House Bill 455. Laboratory experience.

4 qtr. hrs.

EDC 578. CONSULTATION IN THE SCHOOLS: The role of the consultant is examined with emphasis on acquiring effective skills, designed to enable school psychologists, counselors, special education teachers, supervisors, and administrators to assist classroom teachers to improve their teaching effectiveness.

3-4 qtr. hrs.

EDC 579. PRACTICUM: INDIVIDUAL ASSESSMENT AND INTERVENTION: Assessment and intervention experiences, supportive of tests learned in EDC 576, EDC 534, and EDC 577, and of interventions learned in EDC 596, are carried out in schools under the supervision of school psychologists.

3 qtr. hrs.

EDC 580. GUIDANCE IN THE ELEMENTARY SCHOOL: Concepts and techniques for teachers and counselors discussed within the framework of the essential guidance services with attention to characteristics of elementary schools. Emphasis on today's child; child problem situations; theories for understanding child behavior; basic guidance services; roles and responsibilities of personnel; cross-cultural counseling; consulting with parents, teachers, administrators; record analysis, observation, pupil-participating assessment techniques; information dissemination and career education.

3 qtr. hrs.

EDC 581. TECHNIQUES OF CHILD COUNSELING: Focus on practical counseling, consulting and intervention techniques for specific developmental, social or behavior problems children experience. Suggestions for counseling children who are "exceptional" or experiencing special concerns resulting from societal problems.

3 qtr. hrs.

**EDC 583. THEORIES AND TECHNIQUES OF GROUP COUNSELING:** This course has two purposes: to enable the counselor to work effectively with groups; and to achieve deeper counselor self-understanding, through participation in the group process. (One fourth of class time is devoted to lectures and three fourths to participation.)

4 qtr. hrs.

**EDC 584. PRACTICUM: GROUP COUNSELING:** Supervised practice and observation in group counseling techniques.

4 qtr. hrs.

**EDC 594-595. INTERNSHIP FOR SCHOOL PSYCHOLOGISTS:** A job-related program for nine months under the immediate supervision of a trained school psychologist. The intern will receive a stipend, made available from the State of Ohio Foundation funds.

12 qtr. hrs.

**EDC 598. FIELD EXPERIENCE IN SOCIAL AGENCIES:** Directed experience in professional functions within cooperating social agencies in the community.

4 qtr. hrs.

**EDC 599. FIELD EXPERIENCES IN PERSONNEL SERVICES:** Extensive directed experience in professional functions within new kinds of cooperating schools and community organizations. May be repeated three times. Prerequisite: permission, chairperson of Department of Counselor Education and Human Services.

4 qtr. hrs.

**EDC 602. COUNSELING SEMINAR:** The goal of the Counseling Seminar is to assist graduate students in the gaining of knowledge and increased skills within the Nine Dimensions identified in *Guidance Services for Ohio Schools*.

1-6 qtr. hrs.

**EDC 620. REALITY OF A SUCCESS-ORIENTED CLASSROOM:** The problems encountered in providing a meaningful and realistic educational experience for students, particularly for those who deviate from a normal profile pattern. Requires counselors to obtain a new set of skills in working with administrators, teachers, and parents.

3-5 qtr. hrs.

**EDC 635. MARRIAGE AND FAMILY COUNSELING:** Designed to introduce students to perspectives of the marital relationship, the dynamics of adjustment and discord, theories and techniques of marriage counseling, and professional and legal issues. Students will acquire skills and understanding relative to the role of the counselor and teacher in asserting methodologies designed to solve problems within the structure. Special focus on family sculpturing and skill development through the utilization of simulations and role-playing demonstrations.

4 qtr. hrs.

**EDC 653. FIELD EXPERIENCES IN SCHOOL SOCIAL WORK:** Extensive directed experience in professional functions within new kinds of cooperating schools. Prerequisite: permission of chairperson of Department of Counselor Education and Human Services.

5 qtr. hrs.

**EDC 655. CAREER GUIDANCE INSTITUTE:** Designed to assist counselors, teachers, and administrators in implementing an effective Career Guidance Program within their respective schools.

3 qtr. hrs.

**EDC 673. COUNSELING ETHNIC MINORITIES:** Treatment of theories, approaches, and techniques for counseling ethnic clients. Emphasis on establishing and maintaining individual counseling relationships with ethnic minority clients. Methods for facilitating interracial group experiences presented.

3 qtr. hrs.

**EDC 801. INTERPERSONAL DYNAMICS: INDIVIDUAL AND ORGANIZATIONAL:** This course aims to improve a student's ability to communicate effectively. The student will learn that an effective organization is a group of people working together toward its objectives. The more each member and leader is aware of interaction patterns in the organization, the more effectively each influences it. *3 qtr. hrs.*

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**Department of**  
**EDUCATIONAL**  
**ADMINISTRATION (EDA)**

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Donald J. Frericks, Chairperson of the Department

It is the primary mission of the Department of Educational Administration to prepare individuals to be educators who will understand and be able to implement a leadership role in education. The department is committed to productive scholarship, effective teaching, disciplined inquiry, collaborative learning, and the acceptance, in an academic sense, of divergent views. Opportunity is provided for all students to achieve skills and other measured accomplishments.

Faculty are committed to assisting students in developing the inquiry skills of critical thinking, independent learning, and problem finding and solving. Admission to any program within the department implies commitment on the part of both student and faculty to work toward achievement of the goals of the department.

The Department of Educational Administration is committed to providing quality instruction and support to individuals who: 1) have demonstrated leadership potential within an educational setting and have expressed interest in pursuing a master's degree in educational leadership; or 2) hold a master's degree and wish to pursue a specific administrative certification program (elementary school principal, secondary school principal, educational administrative specialist, assistant superintendent, local superintendent and superintendent); or 3) are interested in earning the Educational Specialist's degree; or 4) wish to improve their educational leadership knowledge and skills.

## **ADMISSION REQUIREMENTS**

To enter the program the applicant for graduate study in Educational Leadership is expected to meet the following requirements:

1. Hold a bachelor's degree from a four-year regionally accredited college or university.
2. Have a grade point average of 2.5 or better out of a possible 4.0 in the undergraduate program. Those students having less than a 2.5 average may have the opportunity to attempt to enter the program on a conditional basis by examination.

- 3. Complete an application for admission to graduate studies and submit it to the Office for Graduate Studies along with official undergraduate transcripts and three letters of recommendation.

Upon acceptance into the program, the student will be assigned a faculty advisor who will help develop a course of study to meet the individual needs of the student.

**DEGREE REQUIREMENTS**

To earn a Master of Science in Education Degree in Educational Leadership the student is required to complete a minimum of 45 quarter hours, achieving a grade point average of 3.0 or better. The following courses must be included in the required 45 quarter hours:

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4
EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

**APPLICATION FOR CANDIDACY**

Application for candidacy is achieved by the student upon the successful completion of 20 quarter hours of course work in the program which includes *two* of the following courses:

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4

**DEPARTMENTAL CONFERENCE**

Upon completion of all course work for the master's degree program, the student will be sent a list of questions which are to be answered and mailed to the department prior to the departmental conference. All students are required to participate in a departmental conference in the term of graduation.

**SUPERVISOR'S CERTIFICATE WITHIN THE MASTER'S DEGREE**

A supervisor's certificate may be obtained as a part of the master's degree program by completing the course work required for a degree.

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4

EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4
EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

Also required is evidence of 27 months of successful teaching experience under a standard certificate in the field for which the supervisor's certificate is sought.

## **ELEMENTARY SCHOOL PRINCIPAL'S CERTIFICATE**

A total of 68 quarter hours is required to obtain an elementary school principal's certificate. Forty-five of the hours will have been completed through the master's degree program with an additional 23 quarter hours needed to fulfill the requirements for a principal's certificate. The following courses are required for this certificate and may have been completed in the master's degree program.

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4
EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

In addition, the following 23 quarter hours of course work are required for the elementary school principal's certificate and may be completed in a post-master's degree program.

EDA 604	Elementary School Administration .....	3
EDA 610	Curriculum Leadership .....	3
EDA 621	Public Relations/Policy Development .....	3
EDA 615	School Law II .....	3
EDA 617	School Finance & Economics .....	4
EDA 626	Staff Personnel Services .....	4
EDA 607	Planned Field Experience II .....	3

Also required is evidence of 27 months of satisfactory teaching experience of which at least 18 months shall have been in grades K-8 under a standard teaching certificate or under a standard special teaching certificate.

**SECONDARY SCHOOL  
PRINCIPAL'S CERTIFICATE**

A total of 68 quarter hours are required to obtain a secondary school principal's certificate. Forty-five of the hours will have been completed through the master's degree program with an additional 23 quarter hours needed to fulfill the requirements for a principal's certificate. The following courses are required for this certificate and may have been completed in the master's degree program:

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4
EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

In addition, the following 23 quarter hours of course work are required for the secondary school principal's certificate and may be completed in a post-master's program.

EDA 605	Secondary School Administration .....	3
EDA 610	Curriculum Leadership .....	3
EDA 621	Public Relations/Policy Development .....	3
EDA 615	School Law II .....	3
EDA 617	School Finance & Economics .....	4
EDA 626	Staff Personnel Services .....	4
EDA 607	Planned Field Experience II .....	3

Also required is evidence of 27 months of satisfactory teaching experience of which at least 18 months shall have been in grades 7-12 under a standard high school teaching certificate or under a standard special teaching certificate.

**EDUCATIONAL ADMINISTRATIVE  
SPECIALIST CERTIFICATE**

The Educational Administrative Specialist certificate may be earned with a total of 68 quarter hours issued in the following areas of specialization:

- 1) Business Management
- 2) Educational Research
- 3) Educational Staff Personnel Administration
- 4) Instructional Services
- 5) Pupil Personnel Administration
- 6) School and Community Relations
- 7) Special Education (Exceptional Children)

For information concerning this type of certificate, please contact the office of Educational Administration.

## ASSISTANT SUPERINTENDENT CERTIFICATE

A total of 75 quarter hours are required to obtain an assistant superintendent's certificate. Forty-five of the hours will have been completed through the Master's degree program with an additional 30 quarter hours needed to fulfill the requirements for an assistant superintendent's certificate. The following required courses may have been completed in the master's degree program:

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4
EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

In addition, the following 30 quarter hours of course work are required for the assistant superintendent's certificate and may be completed in a post-master's program.

EDA 604	Elementary School Administration .....	3
EDA 605	Secondary School Administration .....	3
EDA 610	Curriculum Leadership .....	3
EDA 621	Public Relations/Policy Development .....	3
EDA 615	School Law II .....	3
EDA 617	School Finance & Economics .....	4
EDA 626	Staff Personnel Services .....	4
EDA 607	Planned Field Experience II .....	3
EDA 716	Business Affairs & Physical Resources .....	4

Also required is evidence of 27 months of satisfactory experience in a teaching, supervisory or administrative position under the appropriate certificate.

## LOCAL SUPERINTENDENT AND SUPERINTENDENT CERTIFICATE

A total of 90 quarter hours are required to obtain either a local superintendent or a superintendent's certificate. Forty-five of the hours will have been completed through the master's degree program, with an additional 45 quarter hours needed to fulfill the requirements for both of these certificates. The following required courses may have been completed in the master's degree program:

EDA 505	Educational Leadership .....	4
EDA 506	School Administration .....	4
EDA 509	Supervision .....	4
EDA 513	Evaluation of Educational & Organizational Systems .....	4
EDA 511	Curriculum .....	4



EDA 510	Instructional Leadership .....	4
EDT 502	Philosophical Studies in Education .....	4
EDC 530	Psychology of Individual Differences .....	4
EDA 515	School Law I .....	3
EDA 508	Computers in Educational Leadership .....	3
EDA 507	Planned Field Experience I .....	4
EDA 519	Independent Learning .....	3

In addition, the following 45 quarter hours of course work are required for both superintendent certificates and may be completed in a post-master's program.

EDA 604	Elementary School Administration .....	3
EDA 605	Secondary School Administration .....	3
EDA 610	Curriculum Leadership .....	3
EDA 621	Public Relations/Policy Development .....	3
EDA 615	School Law II .....	3
EDA 617	School Finance & Economics .....	4
EDA 626	Staff Personnel Services .....	4
EDA 607	Planned Field Experience II .....	3
EDA 716	Business Affairs & Physical Resources .....	4
EDA 718	The Superintendency .....	4
EDA 719	Human Relations in Educational Leadership .....	4
EDA 710	Curriculum & Instruction .....	4
EDA 722	Collective Bargaining & Contract Management .....	3

Also required is evidence of 27 months of satisfactory experience in an administrative or supervisory position under the appropriate certificate.

## COURSES OF INSTRUCTION

EDA 505. EDUCATIONAL LEADERSHIP: The focus of this course is leadership within schools and the role of the leader in maintaining and/or bringing about change within the school building, department or other educational unit. *4 qtr. hrs.*

EDA 506. SCHOOL ADMINISTRATION: A survey course in school administration, focuses upon the history and philosophies of administration, theories of administration, the school governance system, and major administrative task areas. *4 qtr. hrs.*

EDA 507. PLANNED FIELD EXPERIENCE: This course provides opportunities for the student to experience supervisory/administrative responsibilities in a planned personalized program. Emphasis is placed on practicing the skills learned in the Master's program, receiving feedback on practical efforts, relating practice to theory, and broadening the student's experience in working with others in the schools primarily on matters of curriculum and instruction. *4 qtr. hrs.*

EDA 508. COMPUTERS IN EDUCATIONAL LEADERSHIP: This course focuses on understanding the uses of the computer for instructional and management purposes. Emphasis will be placed on planning for instruction, evaluating software and hardware in terms of specific needs, and managing-scheduling, record keeping, projecting costs, etc. *3 qtr. hrs.*

EDA 509. SUPERVISION: This course in the theory and practice of supervision is designed to explore essential concepts and skills necessary in providing leadership in the improvement of teaching and learning. Emphasis will be placed on concepts and the means of providing leadership in the supervisory task areas. *4 qtr. hrs.*

EDA 510. INSTRUCTIONAL LEADERSHIP: This course develops skills and attitudes essential in helping others to expand/refine their instructional effectiveness. Emphasis is on helping teachers use alternative models of teaching (reading and math emphasized), diagnosing learner needs, prescribing appropriate learning approaches, and using classroom observation data. *4 qtr. hrs.*

EDA 511. CURRICULUM: This course develops an understanding of the history, purposes, and practices of the elementary/secondary school with the emphasis placed upon materials and practices which have been found to be effective. *4 qtr. hrs.*

EDA 513. EVALUATION OF EDUCATIONAL & ORGANIZATIONAL SYSTEMS: This course is designed to develop knowledge and skills necessary for researching program effectiveness with emphasis placed on delineating, collecting, analyzing, and applying descriptive and judgmental information for the purpose of decision-making and accountability. *4 qtr. hrs.*

EDA 515. SCHOOL LAW I: This course addresses legal issues pertinent to teacher, administrator, and student legal rights and responsibilities in daily school happenings. The legal process, structures of the law, legislation/litigation, and practices to avoid legal infringements are addressed. Primary emphasis is on building level activities. *3 qtr. hrs.*

EDA 519. INDEPENDENT LEARNING: This course involves an in-depth project in the area of educational leadership. The activity may be research-based or may involve evaluation of a recently planned and implemented project within a school system or organization. *3 qtr. hrs.*

EDA 604. ELEMENTARY SCHOOL ADMINISTRATION: POLICY & PRACTICE: This course places emphasis on the application of the administrative process and on the research of school effectiveness to the elementary school setting. Administering the day-to-day operation, management, and evaluation of the elementary school program will be addressed. *3 qtr. hrs.*

EDA 605. SECONDARY SCHOOL ADMINISTRATION: POLICY & PRACTICE: Emphasis on application of the administrative process as well as the research on school effectiveness to the secondary school setting. Focus will include administering the day-to-day operation, management, and evaluation of the secondary school program. *3 qtr. hrs.*

EDA 607. PLANNED FIELD EXPERIENCE II: The planned field experience is intended to provide the participant with an opportunity to relate the course work, research, simulation, and independent study in which he/she has engaged to actual problems encountered in administering the elementary or secondary school building/program. The field experience provides a laboratory in which the student may test the skills, concepts, and philosophy acquired through his/her certification program. *3 qtr. hrs.*

EDA 610. CURRICULUM LEADERSHIP: Skills and abilities in leading others in the curriculum development/refinement process are developed in this course. *3 qtr. hrs.*

EDA 615. SCHOOL LAW II: This course deals with the law as it relates to the operation of the school district and the political structures in which it exists. A study of the statutes, judicial decisions, and opinions of the Attorney General on both the state and federal levels will be emphasized. In addition, the course will include a study of the responsibilities and the legal authority of boards of education, administrators, teachers and other school employees. *3 qtr. hrs.*

EDA 617. SCHOOL FINANCE & ECONOMICS: This course addresses the basic principles of school finance and economics. The technical problems of budgeting, sources of income, purchasing, accounting, debt service, and local and state taxes will also be addressed. *4 qtr. hrs.*

EDA 621. PUBLIC RELATIONS/POLICY DEVELOPMENT: Philosophy and techniques of school-community relations for educational leaders as well as policy planning, goal setting, and evaluation for school program and pupil achievement are discussed. *4 qtr. hrs.*

EDA 626. STAFF PERSONNEL SERVICES: This course looks at the systematic selection, evaluation, assignment, and development of both professional and classified school personnel. Emphasis will be placed on professional negotiations with an analysis of various negotiated agreements as they relate to the staff and to administration. *4 qtr. hrs.*

EDA 710. CURRICULUM AND INSTRUCTION: This course provides students an opportunity to refine their understanding of research findings on effective instruction, program developments, instructional improvement, and effective management approaches in curriculum and instruction. *4 qtr. hrs.*

EDA 716. BUSINESS AFFAIRS AND PHYSICAL RESOURCES: This course provides the student the opportunity to gain a complete understanding of the fiscal operation of the total school district. In addition, the proper use of physical resources, conservation of energy in the operation of school buildings, facilities for handicapped students and the development of new facilities will be studied. *4 qtr. hrs.*

EDA 718. THE SUPERINTENDENCY: This course addresses the duties and responsibilities of central office administrators, especially those of the superintendent. Emphasis is placed on Board of Education relations, communication, and an analysis of the political structures within which the superintendent operates. *4 qtr. hrs.*

EDA 719. HUMAN RELATIONS IN EDUCATIONAL LEADERSHIP: This course focuses on improving the student's ability to communicate effectively in complex social systems. Emphasis is placed on group process, conflict management, values, and leader communication in an organization. *4 qtr. hrs.*

EDA 722. COLLECTIVE BARGAINING AND CONTRACT MANAGEMENT: This course provides students with a history of the development of collective bargaining, the procedures and techniques of collective bargaining and contract management, and the role and responsibilities of administrators in carrying out these functions. *4 qtr. hrs.*

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# EDUCATIONAL SPECIALIST IN EDUCATIONAL LEADERSHIP (EDL)

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Donald J. Frericks, Director of the Program

Offered Jointly by  
The Colleges of Education and The Graduate Schools of  
The University of Dayton and Wright State University

This Post-Master's Educational Specialist Degree, Ed.S., program is designed to enhance individual capabilities for educational leadership in the following roles: superintendent, assistant superintendent, director, supervisor and principal. The areas of staff/organization development, program development and evaluation, law/finance/facilities, public relations, research, and computers are included. Emphasis is given to preparing individuals for central office positions.

A planned program of study requires a minimum of 50 quarter hours of graduate work beyond the master's degree. Course work will be offered in a sequential order so that all of the requirements can be completed in a two year period.

In this degree program course work may be completed either at the University of Dayton or at Wright State University. Previous post-master's course work may be transferred into the program if it supports the objectives of the overall program.

## ADMISSION REQUIREMENTS

1. Admission to the Graduate School.
2. A master's degree.
3. Five years of professional experience in teaching and/or administration.
4. Submission of 3 letters of recommendation.
5. Earned cumulative grade point average of 3.5 or better on the graduate level.
6. Acceptance by a committee of department members.

## PROGRAM REQUIREMENTS

	<i>Quarter Hours</i>
<b>Core Courses</b> .....	12
Organizations as Social Systems .....	3
Curriculum & Instruction .....	3
Program & Staff Development & Evaluation .....	3
Ideas that Shape American Education.....	3
<b>Concentration Courses</b> .....	27
Administrative Leadership Skills .....	3
Curriculum & Instruction Leadership .....	3
Computer Application for Educational Leaders .....	3

Staff Personnel/Negotiations .....	3
Public Relations/Politics .....	3
School Finance .....	3
Business & Facilities Management .....	3
School Law .....	3
Advanced Seminar .....	3

### ***Field-Based Experience (6 quarter hours)***

This course work will give the individual an opportunity to apply knowledge and information in a practical learning situation.

### ***Research Project (2 quarter hours)***

Each student will develop and carry out a research project. This project will relate to the individual's course work, interest, and work responsibilities.

## **COURSES OF INSTRUCTION**

The following specialist degree courses are to be completed through the **University of Dayton**:

EDT 803. RESEARCH I: The student will consider practical applications and issues in research as they relate to educational leadership. It is assumed that all students have demonstrated competency in basic descriptive and inferential statistics. 3 qtr. hrs.

EDA 807. RESEARCH PROJECT: Completion of the research project is an integral part of this degree program. Students will be given two quarter hours of credit for the completion of their research project. 2 qtr. hrs.

EDT 808. IDEAS THAT SHAPE AMERICAN EDUCATION: This course addresses the consideration of selected ideas in their initial form which have shaped American education. Particular emphasis will be placed upon ideas which focus upon the learner and the curriculum. Underlying those considerations and emphases will be the assumption that history may be utilized as a policy science. 3 qtr. hrs.

EDA 810. CURRICULUM AND INSTRUCTION: This course is designed to refine participant understanding of the realms of meaning, the characteristics of effective programs, research findings on effective instruction, and effective curriculum management approaches. 3 qtr. hrs.

EDA 812. PROGRAM & STAFF DEVELOPMENT & EVALUATION: This course is designed to strengthen student competence with program development and evaluation processes. Major emphasis is focused on staff development planning, program implementation, and program assessment. 3 qtr. hrs.

EDA 815. SCHOOL LAW: This course addresses the statutes and judicial decisions related to legal authority and describes the responsibilities of boards of education, teachers and administrators. Emphasis will be placed on understanding the legal framework necessary for education to carry out its mandated responsibility: the education of all children of all people. 3 qtr. hrs.

**EDA 817. SCHOOL FINANCE:** This course presents guiding principles for developing adequate financial programs; the detailed study of sources of revenues, local, state, and federal; and the procedures in managing school funds with reference to budgeting, accounting, and auditing. *3 qtr. hrs.*

**EDA 819. BUSINESS-FACILITIES MANAGEMENT:** In this course the student gains an understanding of the complete fiscal operation of the school district from a business affairs point of view, and will also study the proper use of the school district's physical resources will be emphasized. Energy conservation, facilities for the handicapped and construction of new facilities will be discussed. *3 qtr. hrs.*

**EDA 821. PUBLIC RELATIONS AND POLITICS:** This course is designed to assist school administrators in identifying their responsibility in communications, in their leadership role. Provisions are made for the development of guidelines, techniques, and practices which can be utilized to facilitate wholesome relationships between school and community. *3 qtr. hrs.*

## COURSES OF INSTRUCTION

The following Specialist degree courses may be completed at **Wright State University** or equivalent courses may be completed at the **University of Dayton**:

**(WSU) ORGANIZATIONS AS SOCIAL SYSTEMS:** This course advances the student's knowledge of effecting change with individuals and groups within a social system. It also provides students with a working familiarity with systematic models useful for effecting change and assists them in identifying and developing skills useful to a leader functioning as a change agent. *3 qtr. hrs.*

**(WSU) FIELD EXPERIENCE I:** This initial field experience course is designed to offer students a broad base of field experiences within an educational setting upon which future learning may take place. *2 qtr. hrs.*

**(WSU) STAFF PERSONNEL/NEGOTIATIONS:** The course presents hypotheses, principles, and practice for dealing with school personnel problems. Emphasis is placed on the areas of recruitment, selection, induction, appraisal, development, compensation and motivation of personnel. Exploration of legal cases and concepts which have emerged as a result of conflict resolution and adjudication in the courts and an analysis of negotiated agreements and case studies in the field of education also will be utilized. *3 qtr. hrs.*

**(WSU) ADMINISTRATIVE LEADERSHIP SKILLS:** The focus of this course is upon the analysis of organizations. A variety of organizational structures which reflects a continuum of beliefs is explored and organizational theory is analyzed in an attempt to specify the relationship among the various needs of an organization. Also covered is the individual's role and function within an organization. Emphasis is placed on the following concepts: behavioral science theory, management and leadership styles, theories and models of leadership, and the skills necessary for effective leadership. *3 qtr. hrs.*

**(WSU) CURRICULUM & INSTRUCTION LEADERSHIP:** To develop skills and abilities in leading others in curriculum development; to expand knowledge of teaching skills and methods of assisting others in developing their instructional effectiveness. *3 qtr. hrs.*

(WSU) COMPUTER APPLICATION FOR EDUCATIONAL LEADERS: To assist school personnel in the understanding of computer utilization for instruction and management.

*3 qtr. hrs.*

(WSU) FIELD EXPERIENCE II: The intention of this course is to provide students with the opportunity to relate course work with practical field-based experience in the area of educational leadership. The focus of this experience is broad-based in terms of leadership and will help the student plan the specific concentration activities of the third field-based experiences. Students are given the opportunity to identify and refine their human relations skills necessary in achieving organizational goals.

*2 qtr. hrs.*

(WSU) FIELD EXPERIENCE III: A continuation of the purpose and function of the initial field-based experience. Focus of this course is upon an added depth of demonstration of the concepts and skills of educational leaders. Further, this course will emphasize and utilize the knowledge and skills required in the concentration area.

*2 qtr. hrs.*

(WSU) ADVANCED SEMINAR: A capstone course which synthesizes the concepts, skills, and information of the total specialist's program. Presentation of the student's research project is an integral part of this course.

*3 qtr. hrs.*

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## Department of

## PHYSICAL AND HEALTH EDUCATION (EDP)

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Doris A. Drees, Chairperson of the Department

The Department of Physical and Health Education offers a program leading to the Master of Science in Education. It is a flexible, personalized program providing the student with advanced training in physical education to develop special capabilities that will enable the student to become a competent practitioner and leader in the field of physical education.

## ASSISTANTSHIPS

Graduate assistantships are available. A graduate assistant's assignment would be to teach in the basic activity program in physical education or would have substitute duties as assigned by the chairperson. Graduate assistants will receive a stipend for the academic year (nine months) plus waiver of registration fees and tuition. Interested applicants should contact the department.

## ADMISSION REQUIREMENTS

The applicant for graduate study must meet the following requirements:

1. The applicant must be a graduate of an accredited four-year college or university.
2. The applicant must hold a teacher's certificate in physical education.
3. The applicant must have a grade point average of 2.5 or better out of a possible 4.0 in the undergraduate program.

ADVISING

The coordinator of the graduate program within the department will act as the student’s academic advisor. A personalized program will be planned with the student during his first term of enrollment in an effort to meet the professional and personal goals and needs. The coordinator will also counsel the student on the purpose and requirements of graduate work, selection of courses, and the options available within the department.

PROGRAM REQUIREMENTS

A minimum of 45 quarter hours is required. Students must achieve an average of at least B (3.0) in all work undertaken in order to qualify for graduation.

Candidacy

A student becomes a candidate for the master’s degree if the cumulative point average for graduate work, the preliminary plan for the research project (if Option A), and the reference appraisals are judged to be acceptable by the graduate committee of the Department of Physical Education.

The most important consideration in the admission of a student to candidacy is the quality of his graduate work to date. Evidence of being able to meet all the graduation requirements must be given. The applicant who is deemed unqualified at this point, will be advised to discontinue the program.

A student should apply for admission to candidacy after completion of 25 quarter hours of graduate work, including at least two courses in Physical Education and EDP 555, Survey of Research Processes and Design in Physical Education. Application is made by filing the official candidacy form with the School of Education office.

Comprehensive Examination

Successful completion of a written comprehensive examination is required for graduation. The comprehensive examination, three hours in length, will basically cover the student’s area of concentration (Physical Education courses). The examination may be taken during the student’s last term of course work or upon the completion of the course work in the area of concentration. It is given once during each of the three regular terms. It is the student’s responsibility to make formal application one month in advance for the examination. Examination dates will be posted at the beginning of each term.

If a student fails the examination the first time, a second opportunity will be given. Failure the second time incurs failure and dismissal from the program.

	<i>Quarter Hours</i>
<b>Master of Science in Teaching Physical Education</b> .....	45
<b>Required Core Course</b> .....	16
EDT 502 Philosophical Studies of Education .....	4
EDT 501 Learning Theory and Education .....	4
EDT 504 Human Development and Education .....	4
OR	
EDP 555 Survey of Research Processes & Design in Physical Education .....	4
EDP 560 Evaluation & Applied Statistics in Physical Education .....	4



**Area of Concentration—Physical Education** . . . . . 18 quarter hours  
 MUST TAKE A *MINIMUM OF ONE* COURSE FROM EACH OF THE THREE  
 SUB—CATEGORIES.

MUST DECLARE AREA OF INTEREST. SELECT ONE OF THE FOLLOWING  
 SUB—CATEGORIES. MINIMUM OF TWO (2) COURSES REQUIRED IN  
 STUDENT'S AREA OF INTEREST.

*Quarter Hours*

**I. Historical and Sociological Aspects of Physical Education**

EDP 510 History of Physical Education . . . . .	4
EDP 519 Sport and Society . . . . .	3
EDP 540 Women in Sport . . . . .	4

**II. Administration: Methodology**

EDP 523 Curriculum Development of Physical Education . . . . .	3
EDP 529 Innovative Practice in P.E. . . . .	3
EDP 547 Administration of Interscholastic and Intramural Athletics .	3
EDP 548 Safety and the Law in Physical Education and Sport . . . . .	4
EDP 556 Issues in Physical Education (Seminar) . . . . .	3

**III. Scientific Basis**

EDP 531 Nutrition for the Athlete . . . . .	3
EDP 537 Biomechanics . . . . .	4
EDP 538 The Nature and Basis of Motor Skill Acquisition . . . . .	3
EDP 546 Scientific Principles of Athletic Conditioning . . . . .	3
EDP 550 Physiological Responses to Exercise . . . . .	4
EDP 551 Laboratory Techniques for the Applied Practitioner . . . . .	3

**Electives** . . . . . 3-6

Courses selected from general, professional, physical or health education.

**Options** . . . . . 5-8

A. Research Project . . . . . 5-8

OR

B. Additional coursework in physical education . . . . . 5

## COURSES OF INSTRUCTION

EDP 508. PHYSICAL EDUCATION WORKSHOPS: Workshops designed for study of special topics of current interest in physical education. May focus attention on substantive material or operational problems. May be repeated up to a maximum of 2 courses. *1-4 qtr. hrs.*

EDP 509. HEALTH EDUCATION WORKSHOPS: Workshops designed for study of special topics of current interest in health education. May focus attention on substantive material or operational problems. May be repeated up to a maximum of 2 courses. *1-4 qtr. hrs.*

EDP 510. HISTORY OF SPORT AND PHYSICAL EDUCATION: Study of the development of sport and physical education from early cultures to the present time. Emphasis on the United States. *4 qtr. hrs.*

EDP 519. SPORT AND SOCIETY: A study of the cultural patterns, socializing process, and other psychosocial parameters of American sport. *3 qtr. hrs.*

**EDP 523. CURRICULUM DEVELOPMENT OF PHYSICAL EDUCATION:** Principles and procedures for curriculum construction and revision; criteria for selecting activities and judging outcomes; the place of physical education within the total curriculum.

*3 qtr. hrs.*

**EDP 529. INNOVATIVE PRACTICES IN PHYSICAL EDUCATION:** Practical and theoretical study of innovative methods of teaching physical activities.

*3 qtr. hrs.*

**EDP 531. NUTRITION FOR THE ATHLETE:** A course designed to investigate the latest research trends in the nutritional assessment of the athlete. Topics to be discussed will pertain to dietary needs, fluid replenishment, pre-game meals, and "fad" diets for the athlete.

*3 qtr. hrs.*

**EDP 537. BIOMECHANICS:** Investigations of physical principles operative in the performance of physical education activities with attempts to analyze for methods of greater effectiveness and improved performance.

*4 qtr. hrs.*

**EDP 538. THE NATURE AND BASIS OF MOTOR SKILL ACQUISITION:** A study of psychological factors which affect the acquisition of motor skills. Perceptual-motor development theories. Motor behavior.

*3 qtr. hrs.*

**EDP 540. WOMEN IN SPORT:** A study of the historical, psychological, sociological and biophysical aspects of the American woman in sport.

*4 qtr. hrs.*

**EDP 546. SCIENTIFIC PRINCIPLES OF ATHLETIC CONDITIONING:** Study of the factors which affect maximum human performance in athletic competition. Application of scientific principles in preparing the athlete for maximum performance. Methods and theories of training, conditioning, and reconditioning.

*3 qtr. hrs.*

**EDP 547. ADMINISTRATION OF INTERSCHOLASTIC AND INTRAMURAL ATHLETICS:** Organization of high school athletic and intramural programs, staff, program, budget, health and safety, and other phases of administration.

*3 qtr. hrs.*

**EDP 548. SAFETY AND THE LAW IN PHYSICAL EDUCATION AND SPORTS:** Study of basic safety measures to prevent injuries and avoid legal suits. Investigation of the fundamental principles involved in the legal aspects of sports in contemporary society. Analysis of specific court cases dealing with negligence in physical education and sport.

*4 qtr. hrs.*

**EDP 550. PHYSIOLOGICAL RESPONSES TO EXERCISE:** A study of the physiological changes that occur during exercise and training.

*4 qtr. hrs.*

**EDP 551. LABORATORY TECHNIQUES FOR THE PHYSICAL EDUCATION PRACTITIONER:** The practical application of selected physical education tests and measurements. Emphasis will be placed on human performance (strength, cardiovascular, flexibility, and body composition) testing.

*3 qtr. hrs.*

**EDP 555. SURVEY OF RESEARCH PROCESSES AND DESIGN IN PHYSICAL EDUCATION:** This course is designed to develop an understanding of the nature of the general field of physical education research. It emphasizes the application of various research processes and design, learning by doing, and learning through example. It is intended for use by individuals who have minimal knowledge of statistics.

*4 qtr. hrs.*

**EDP 556. ISSUES IN PHYSICAL EDUCATION (SEMINAR):** A seminar to investigate and report on a specific issue in physical education.

*3 qtr. hrs.*

EDP 560. EVALUATION AND APPLIED STATISTICS IN PHYSICAL EDUCATION: Application of descriptive and inferential statistics to physical education tests and measurements. Qualitative and quantitative analysis of selected physical fitness, motor performance, and body composition data. *4 sem. hrs.*

EDP 575. INDIVIDUAL STUDIES IN PHYSICAL EDUCATION: Individual investigations of a problem in physical education or health. (With approval of advisor.) *1-4 qtr. hrs.*

EDP 579. SEMINAR IN HEALTH EDUCATION: A problem course for experienced teachers. *3 qtr. hrs.*

EDP 582. INTERNSHIP IN PHYSICAL EDUCATION: A job-related experience under the immediate supervision of personnel from a local school or community organization. *4 qtr. hrs.*

EDP 591. RESEARCH PROJECT: Action research initiated after consultation with advisor. A systematic study of a specific problem. Prerequisite for registration: Completion of EDF 503, Research Methodology and Statistics, and approval of preliminary plan. *6 qtr. hrs.*

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## Department of TEACHER EDUCATION (EDT)

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Thomas J. Lasley, Chairperson

James E. Gay, Assistant Chairperson for Graduate Programs

The Teacher Education Department's mission is the development of competent and humane teachers. Recognizing the value of balancing theory and practice in professional education, the department provides its students and faculty with the opportunity to be of service and to do research in schools and in other educational agencies. It dedicates itself to the discovery and transmission of the knowledge, skills, attitudes, and values which enable teachers to become educational leaders. Its goal is to be a center of excellence in teacher education.

The department offers seven concentrations at the graduate level:

**Computers in Education**  
**Building Leadership**  
**Elementary Education**  
**Interdisciplinary Studies**

**Reading Teacher**  
**Secondary Education**  
**Gifted Education**

The department also offers the initial teaching certificate for students desiring to teach in elementary or secondary schools and certification in:

**Developmentally Handicapped**  
**Multi-handicapped**

**Specific Learning Disabled**  
**Pre-kindergarten.**

## ADMISSION REQUIREMENTS

Students must have a 2.5 undergraduate GPA and three letters of recommendation to be admitted to the Department of Teacher Education. If a student does not have an undergraduate GPA of 2.5 but feels capable of graduate work, that student may petition the assistant chairperson, Department of Teacher Education, for admission.

Students taking courses in the Department of Teacher Education are reminded that a maximum of twelve (12) quarter hours earned as an Unclassified Graduate Student can be applied toward the master's degree. Therefore, all students at the time they first begin taking graduate classes are urged to apply for regular graduate admission.

If students have student teaching as part of their programs, they must apply for an assignment in the term prior to the student teaching term.

## CORE REQUIREMENTS FOR THE MASTER'S DEGREE

### *Quarter Hours*

1. EDT 500 Models of Teaching . . . . . 4
2. EDT 502 Philosophical Studies in Education . . . . . 4
3. EDT 503 Educational Research Methodology . . . . . 4
4. EDT 670 Master's Project . . . . . 5
5. A minimum of 45 quarter hours with not more than eight (8) quarter hours being workshops (i.e. codes with W, and EDT 508W, and courses for which the grade is CR/NC).
6. Participation in the departmental conference held in the final term of the student's program.

### **Notes**

1. EDT 503 should be taken between the 12th and 20th quarter hour (i.e., about one-third of the way through the program).
2. Students should register for the Master's Project in the term they expect to graduate. EDT 500, 502, and 503 and at least three-fourths of the concentration courses need to be completed prior to registration for EDT 670.

## CONCENTRATION REQUIREMENTS

### COMPUTERS IN EDUCATION

### *Quarter Hours*

- |         |  |     |
|---------|--|-----|
| EDT 538 | Introduction to Computers . . . . .              | 1-2 |
| EDT 539 | Computers in Education . . . . .                 | 4   |
| EDT 540 | Advanced Computers in Education . . . . .        | 4   |
| EDT 541 | Methods: Computers in Education . . . . .        | 4   |
| EDT 542 | Special Topics: Computers in Education . . . . . | 4   |
| — —     | Approved Electives . . . . .                     | 10  |

### **Notes**

1. EDT 539 is a prerequisite for EDT 540.
2. Students should register for a total of four quarter hours for EDT 542, which consists of two workshops.
3. Students taking EDT 538 for 1 quarter hour will need 11 quarter hours of approved electives.

**BUILDING LEADERSHIP**

Quarter Hours

EDT 545	Advanced Developmental Reading .....	4
EDT 539	Computers in Education .....	4
EDT 504	Human Development and Education .....	4
EDA 505	Educational Leadership .....	4
EDA 509	Supervision .....	4
EDA 511	Curriculum .....	4
— —	Approved Electives .....	4

**Notes**

*Students who complete this program have an excellent opportunity to serve as a departmental chairperson on the secondary level or as head teacher on the elementary level.*

*With additional coursework, candidates who complete this program can earn a supervisor's certificate. Those interested in earning this certificate should contact the chairperson of the Educational Administration Department.*

**ELEMENTARY EDUCATION**

Quarter Hours

— —	Approved Concentration Courses .....	16
— —	Approved Electives .....	12

**Note**

*The program may be level specific (i.e., primary, elementary), subject related (i.e., language arts, social studies, etc.), or directed toward developing instructional strategies (i.e., individualized instruction, learning style, media, etc.). The program and elective courses must be decided by the student and the advisor.*

**GIFTED EDUCATION**

Quarter Hours

EDT 575	Study of Gifted and Talented .....	4
EDT 576	Teaching the Gifted and Talented .....	4
EDT 578	Special Topics in Gifted Education .....	4
EDT 588	Counseling Parents of Exceptional Children .....	4
— —	Approved Electives .....	11

**Notes**

1. *Students interested in working toward validation in Gifted Education should check with the Department Chairperson for courses that fulfill the certification requirements. A checklist identifying required courses at Wright State is available in the Departmental Offices.*

**INTERDISCIPLINARY  
EDUCATIONAL STUDIES**

Quarter Hours

— —	Approved Concentration Courses in Education .....	16
— —	Approved Electives .....	12

**Notes**

1. *Students in the Interdisciplinary program normally draw upon courses offered by two or more departments in the university. Students must prepare a plan of study identifying objectives, courses, and tentative time-line. Typical Interdisciplinary programs have centered around the following: Adult Education, Multicultural Education, Values Education, Psychology and Education, Educational Policy Studies, Learning Styles, etc. Interested students should contact the Assistant Chairperson, Department of Teacher Education.*
2. *The student should meet with two or more faculty members from the two or more departments involved to lay out the approved program courses.*

**READING TEACHER (ENDORSEMENT)***Quarter Hours*

EDT 545	Advanced Developmental Reading .....	4
EDT 546	Research in Reading Instruction .....	4
EDT 547	Diagnosis of Reading Difficulties .....	4
EDT 548	Practicum in Diagnosis of Reading .....	4
EDT 543	Literature for Children and Adolescents .....	4
	(for secondary majors)	
OR	Reading in the Content Area .....	3
EDT 554	(for secondary majors)	
— —	Approved Electives .....	8

**Notes**

1. EDT 545 is the prerequisite for all other reading courses.
2. On the main campus, EDT 547 and 548 should be taken concurrently.

**SECONDARY EDUCATION***Quarter Hours*

— —	Approved Concentration Courses .....	16
— —	Approved Electives .....	12

**Note**

1. The concentration may be subject-related (i.e. social studies, business, English, etc.) or directed toward developing instructional strategies (i.e. individualized instruction, learning styles, media, etc.). The concentration and elective courses must be decided by the student and the advisor.

**INITIAL TEACHING CERTIFICATE****ELEMENTARY***Quarter Hours***Area A**

EDT 501	Learning Theory and Education .....	4
EDT 504	Human Development and Education .....	4
EDT 590	Introduction to Exceptionalities .....	4

**Area B**

EDA 511	Curriculum .....	4
EDT 570	School, Self, and Society .....	4

**Area C**

EDT 526	Mathematics and Science in the Elementary School .....	4
EDT 528	Teaching in the Elementary School .....	4
EDT 543	Literature for Children and Adolescents .....	4
EDT 545	Advanced Developmental Reading .....	4
EDT 635	Social Studies in Elementary School .....	4
EDT 529	Student Teaching: Elementary .....	10-14

**Notes**

1. Each candidate must satisfy a content area requirement of 20 semester hours or 30 quarter hours in an approved pattern of coursework in mathematics, psychology, history, physical science, literature (English), biological science or some other approved field.
2. Students must satisfy a general education requirement of 30 semester hours or 45 quarter hours well distributed over the following areas: biological or physical sciences, humanities, communication, western civilization, American History, mathematics, health and physical education, music, and visual art.

3. *Before student teaching a student must have the equivalent of 300 hours of field and clinical experience.*
4. *Candidates must successfully pass the Pre-professional Skills Test during the first two terms of their enrollment.*
5. *The cumulative Grade Point Average must be 2.5 in professional education courses.*
6. *Students desiring a master's degree in addition to certification must complete the CORE requirements and fulfill admission requirements.*

## SECONDARY

Quarter Hours

### Area A

EDT 501	Learning Theory and Education	4
EDT 504	Human Development and Education	4

### Area B

EDT 570	School, Self and Society	4
EDA 511	Curriculum	4

### Area C

EDT 505	Human Relations in Education	3
EDT 554	Reading in the Content Area	3
EDT --	Special Methods in principle teaching field	4
-- --	Approved Graduate Electives	4
EDT 560	Student Teaching: Secondary	10-14

## Notes

1. *A student must have coursework in the teaching field consistent with the content and scope required for the teaching area. If the student needs additional coursework in the teaching field for certification, courses in the teaching field will be suggested. Graduate level courses in teaching fields are available in the following areas: biology, business, chemistry, communication, English, history, mathematics, physics, political science, and theological studies. Transcript evaluations will be completed by the Dean's office (Undergraduate Secretary).*
2. *A cumulative point average of 2.5 in each teaching field is required for certification.*
3. *The cumulative GPA average must be 2.5 in professional education courses.*
4. *The methods course must be taken prior to student teaching and at the University of Dayton.*
5. *Students must have 30 semester hours in general education distributed over the following areas: science, mathematics, social sciences, English and/or foreign languages, fine arts, religion or philosophy, and humanities.*
6. *Before being allowed to take student teaching (secondary) student must have the equivalent of 300 clock hours of field and clinical experience.*
7. *Students desiring a master's degree in addition to certification must complete the CORE requirements and fulfill admissions requirements.*
8. *Candidates must successfully pass the Pre-professional Skills Test during the first two terms of their enrollment.*

## Additional Certification Programs

The Department of Teacher Education also offers certification through graduate coursework in the following areas: Developmentally Handicapped, Multi-handicapped (Educable Mentally Retarded), Specific Learning Disabled, and Kindergarten-Primary. Persons interested in pursuing these certifications should contact the Dean's office (Undergraduate Secretary) or the Assistant Chairperson, Department of Teacher Education.

## COURSES OF INSTRUCTION

Two new concentration options have been added: (1) The Teacher as Child/Youth Development Specialist; and (2) The Teacher as Educational Leader. Information on requirements for both programs is available from the department office.

**EDT 500. MODELS OF TEACHING:** Analysis and experimentation with several models of teaching that are useful in studying classroom interactions and evaluating teacher performance. *4 qtr. hrs.*

**EDT 501. LEARNING THEORY AND EDUCATION:** Study of contemporary learning theories such as Behaviorism, Gestalt, and cognitive-field psychologies. Interpretations are made for teaching methodology, curriculum design, counseling, and psychological services. *4 qtr. hrs.*

**EDT 502. PHILOSOPHICAL STUDIES IN EDUCATION:** Study of writings of major philosophers as they relate to education (including those in the Marianist tradition). Interpretations are made for the development of a critical, personal theory of teaching, counseling, and educational administration. *4 qtr. hrs.*

**EDT 503. EDUCATIONAL RESEARCH METHODOLOGY:** Study of educational research design, proposal writing, ERIC and other bibliographic sources, and techniques for conducting research in teaching, administration, and counseling. Emphasis is placed on developing a proposal to conduct an individual research project. Prerequisites: EDT 500 and EDT 502. *4 qtr. hrs.*

**EDT 504. HUMAN DEVELOPMENT AND EDUCATION:** Study of contemporary developmental theories such as those of Piaget, Kohlberg, Erikson, and Lewin with interpretations made for teaching methodology, educational administration, counseling, and psychological services. *4 qtr. hrs.*

**EDT 505. HUMAN RELATIONS IN EDUCATION:** Study and development of the human relations skills that promote learning and democratic classroom interaction and management regardless of race, political affiliation, religion, age, sex, socio-economic status, or exceptionality. Clinical experience (15 hrs.). *3 qtr. hrs.*

**EDT 506. VALUES CLARIFICATION AND MORAL DEVELOPMENT:** Examination and evaluation of the theories and techniques of clarifying values and facilitating moral development in students with varied needs and abilities. *4 qtr. hrs.*

**EDT 507. TEACHING AND LEARNING STYLES:** Presentation of the research on learning styles and teaching styles. Interpretations are made for teaching methodology, educational administration, and counseling. *2 qtr. hrs.*

**EDT 508. CURRENT CONTROVERSIES IN EDUCATION:** Study of selected controversies in education as they relate to policy and practice. *2 qtr. hrs.*

**EDT 509. COMPARATIVE EDUCATION:** Study of educational systems in selected countries. Appropriate comparisons of systems of education in Marxist countries and those in democratic countries. Special projects. *4 qtr. hrs.*

**EDT 510. POLITICS OF EDUCATION:** Study of educational policy-making at the local, state, and federal levels. Specific attention is given to the interdependence of these levels as related to contemporary issues. *4 qtr. hrs.*



EDT 511. HISTORY OF EDUCATION IN THE UNITED STATES: Study of the relationship of schools and social changes in the United States from colonial times to the present. Interpretations of changes in educational policies for the development of a critical theory of education. Second term. *4 qtr. hrs.*

EDT 512. HISTORY OF HIGHER EDUCATION IN THE UNITED STATES: Study of the development of post-secondary education in the United States from the Colonial period to the present with special emphasis on topics such as liberal arts, vocational preparation, and community colleges. *4 qtr. hrs.*

EDT 517. INTRODUCTION TO EARLY CHILDHOOD EDUCATION: Study of the development of children from birth through age eight, including psychology of learning and the examination of the cultural, economic, governmental, and social factors that affect family and child. First term, even-numbered years. Clinical and field experience. *4 qtr. hrs.*

EDT 518. KINDERGARTEN — PRIMARY INSTRUCTION: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching children on the kindergarten-primary levels. Clinical and field experience (10 and 20 hrs.). *4 qtr. hrs.*

EDT 519. INSTRUCTIONAL MATERIALS — K-3: Study of psychological principles that should guide instructional material selection; examination, development, and evaluation of materials for kindergarten-primary teaching. Clinical experience (20 hrs.). *4 qtr. hrs.*

EDT 520. STUDENT TEACHING — PRE-KINDERGARTEN: Supervised and evaluated teaching in a pre-kindergarten. Student is to demonstrate the knowledge, skills, attitudes, and values required of a beginning pre-kindergarten teacher. Weekly seminar. Prerequisites: EDT 517 and see advisor. *4 qtr. hrs.*

EDT 521. STUDENT TEACHING — KINDERGARTEN-PRIMARY: Full-time supervised and evaluated teaching in a K-3 setting. Student is to demonstrate the knowledge, skills, attitudes and values required of a beginning K — P teacher. Weekly seminar. Prerequisites: See advisor. *4 qtr. hrs.*

EDT 526. MATHEMATICS AND SCIENCE IN THE ELEMENTARY SCHOOL: Course for teachers and administrators dealing with modern math programs. Demonstration of how patterns of mathematical and scientific thought can be acquired by students. Field experience (20 hrs.). Prerequisite: EDT 528. *4 qtr. hrs.*

EDT 528. TEACHING IN THE ELEMENTARY SCHOOL: Study of the role of the teacher in the classroom including classroom management and human relations, lesson planning, assessment, instructional methods and media, and evaluation of teaching. Clinical experience (30 hrs.). Prerequisite: EDT 501 and EDT 504. *4 qtr. hrs.*

EDT 529. STUDENT TEACHING — ELEMENTARY: Full-time supervised and evaluated teaching for a full term in an elementary school. Student is to demonstrate the knowledge, skills, attitudes, and values required of a beginning elementary school teacher. Weekly seminar. Prerequisites: Formal admission to student teaching a full term in advance and methods courses. *10-14 qtr. hrs.*

EDT 535. EDUCATIONAL MEDIA: A study of materials, equipment, and technology in education. Actual use and evaluation in the classroom. *4 qtr. hrs.*

EDT 536. CREATIVE TEACHING WITH NEWSPAPERS AND OTHER MATERIALS: Innovative uses of newspapers and other inexpensive or free materials to teach mass communication media literacy and enhance the academic skills of students of varied needs and abilities. Dayton Newspapers cooperates in implementing this course.

4 qtr. hrs.

EDT 537. MEDIA: TELEVISION AND TEACHING: An examination of the impact of television on the education of children. Implications are made for teaching methods, curriculum, educational administration, and counseling.

2 qtr. hrs.

EDT 538. INTRODUCTION TO COMPUTERS: An introductory course for those students who have had no experience with a microcomputer. Focuses on such simple concepts as how to turn a computer on, how to use commercial software, etc.

1-2 qtr. hrs.

EDT 539. COMPUTERS IN EDUCATION: Introduction to the uses of computers in education including an examination of data management and applications in various content areas and at various levels. EDT 538 recommended prerequisite.

4 qtr. hrs.

EDT 540. ADVANCED COMPUTERS IN EDUCATION: Design of instruction using computers in the classroom. LOGO and word-processing skills presented and developed. Prerequisite: EDT 539.

4 qtr. hrs.

EDT 541. METHODS: COMPUTERS IN EDUCATION: The use of microcomputers as a problem-solving tool in the classroom and highlights responsibilities for serving as microcomputer consultant in schools. Clinical experience (40 hrs.) Prerequisite: EDT 540.

4 qtr. hrs.

EDT 542. SPECIAL TOPICS: COMPUTERS IN EDUCATION: A class that permits students to examine current issues and topics in computer education such as LOGO and word-processing.

2 sem. hrs.

EDT 543. LITERATURE FOR CHILDREN AND ADOLESCENTS: Study of children's books to develop critical standards for judgment. Guidance in selection of books for specific needs, interests, and reading abilities in eight genres; instructional techniques for use in the classroom. Preschool through senior high school levels. Clinical experience (6 hrs.). Prerequisites: EDT 501 and EDT 504.

4 qtr. hrs.

EDT 545. ADVANCED DEVELOPMENTAL READING: The psychological and sociological basis in reading. Attention to linguistics, materials, skills, literature, and evaluation. This is a prerequisite for other courses in the reading sequence.

4 qtr. hrs.

EDT 546. RESEARCH IN READING INSTRUCTION: A basic course for teachers concerned with the psychology of learning reading and with current problems and trends in reading and children's literature. Prerequisites: EDT 545

4 qtr. hrs.

EDT 547. DIAGNOSIS OF READING DIFFICULTIES: Study of formal and informal diagnostic tests and procedures for identifying reading strengths and weaknesses with applications for reading programs. Field experience (36 hrs.). First term. Prerequisite: EDT 545.

4 qtr. hrs.

EDT 548. PRACTICUM IN DIAGNOSIS OF READING: Laboratory portion of EDT 547. Corequisite or Prerequisite: EDT 547.

4 qtr. hrs.

EDT 549. SUPERVISION AND CURRICULUM IN READING: Study of selected curricula and the process of planning a sound curriculum in reading at various levels. Outline of the role of the reading supervisor, providing guidelines for effective implementation of programs. Prerequisite: EDT 545, EDT 546, EDT 547, and EDT 548.  
4 qtr. hrs.

EDT 553. TOPICS IN READING: This course is designed for teachers and supervisors. It will consist of readings, discussion and written reports on the most recent topics in reading. Prerequisite: Teaching experience and at least one reading course.  
1-4 qtr. hrs.

EDT 554. READING IN THE CONTENT AREAS: Study of reading problems and techniques for teaching vocabulary and reading skills in various content areas. Clinical experience (8 hrs.); plus field experience for secondary education majors.  
3-4 qtr. hrs.

EDT 559. INTERDISCIPLINARY TEACHING: Study of the basic principles, problems, and alternatives in team teaching and interdisciplinary education, exploration and evaluation of curriculum materials.  
4 qtr. hrs.

EDT 562. ENGLISH AND SPEECH IN SECONDARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching English and speech to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). First term. Prerequisites: EDT 501 and EDT 504.  
4 qtr. hrs.

EDT 563. SOCIAL STUDIES IN SECONDARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching social studies to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). First term. Prerequisite: EDT 501 and EDT 504.  
4 qtr. hrs.

EDT 564. FOREIGN LANGUAGE TEACHING: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching foreign languages in elementary and secondary schools to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). First term. Prerequisites: EDT 501 and EDT 504.  
4 qtr. hrs.

EDT 565. MATHEMATICS IN THE SECONDARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching mathematics to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). First term. Prerequisites: EDT 501 and EDT 504.  
4 qtr. hrs.

EDT 566. RELIGION IN THE SCHOOL: Modern methods of instruction in religion in the school with a view to the needs of children and adolescents. Prerequisite: EDT 570.  
4 qtr. hrs.

EDT 567. SCIENCE IN SECONDARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching the biological and physical sciences to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). Prerequisites: EDT 501 and EDT 504.  
4 qtr. hrs.

EDT 570. SCHOOL, SELF, AND SOCIETY: Study of the relationship between institutional reform, personality development, and social change; comparison of rural, urban, and suburban schools and social settings; study of the laws and policies affecting the education of handicapped students. Field and clinical experience (34 and 6 hrs.).  
4 qtr. hrs.

EDT 571. BUSINESS EDUCATION IN SECONDARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching business to students with varied needs and abilities. Field and clinical experience (36 and 18 hrs.). First term. Prerequisite: EDT 501 and EDT 504. 4 qtr. hrs.

EDT 572. STUDENT TEACHING — SECONDARY: Full-time supervised and evaluated teaching in content area junior or senior high school classroom. Student is to demonstrate the knowledge, skills, attitudes, and values required of a beginning secondary teacher after completion of a 65-hr. on-site clinical experience. Weekly seminar. Prerequisites: Admission to student teaching a full semester in advance, methods course. 10-14 qtr. hrs.

EDT 575. STUDY OF GIFTED AND TALENTED STUDENTS: Examination of how different disciplines (e.g. Sociology, Psychology) can help educators understand the nature of gifted and talented students. 4 qtr. hrs.

EDT 576. TEACHING THE GIFTED AND TALENTED: A course designed for teachers, administrators, and counselors to familiarize them with programs for the gifted and talented. Curriculum, instructional materials, and teaching strategies are examined and developed. Prerequisite: EDT 575. 4 qtr. hrs.

EDT 578. SPECIAL TOPICS IN GIFTED EDUCATION: A seminar which permits educators of the gifted to focus on current issues, problems, etc. in gifted education. 4 qtr. hrs.

EDT 580. PSYCHOLOGY AND EDUCATION OF THE MENTALLY RETARDED: Study of identification, characteristics, learning theories, and curriculum planning appropriate to the mentally retarded. Field experience (40 hrs.). Prerequisite: See advisor. 4 qtr. hrs.

EDT 581. STUDENT TEACHING: — DH: Full-time supervised and evaluated teaching in a DH classroom. Student is to demonstrate the knowledge, skills, attitudes, and values required of a beginning DH teacher. Weekly seminar. Prerequisite: See advisor. 4-8 qtr. hrs.

EDT 582. STUDENT TEACHING — MH: Full-time supervised and evaluated teaching in an MH classroom. Student is to demonstrate the knowledge, skills, attitudes, and values required of a beginning MH teacher. Weekly seminar. Prerequisite: See advisor. 4 qtr. hrs.

EDT 587. CAREER EDUCATION FOR HANDICAPPED: Theory and techniques of job classification, assessment, selection, placement, and activities related to work experience from pre-school to adult. Prerequisite: See advisor. 3 qtr. hrs.

EDT 588. COUNSELING PARENTS OF EXCEPTIONAL CHILDREN: Theory and techniques to help teachers work with parents to improve home-school relationships and to develop parent-teacher partnerships. Prerequisite: See advisor. 4 qtr. hrs.

EDT 589. MULTI-HANDICAPPED: Curriculum, planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching the pre-school to adult multi-handicapped. Clinical experience (10 hrs.) Prerequisite: See advisor. 3 qtr. hrs.

EDT 592. CURRICULUM AND METHODS — MR: Curriculum development, instructional materials, and evaluation techniques and individual programming for the MR student. Clinical experience (10 hrs.). Prerequisite: See advisor. 6 qtr. hrs.

EDT 593. EDUCATING STUDENTS WITH SLD: Study of history, identification, characteristics, learning theories, and curriculum planning appropriate to the education of students with specific learning disabilities. Field and clinical experience (10 and 20 hrs.). Prerequisite: See advisor. 4 qtr. hrs.

EDT 594. DIAGNOSTIC TEACHING IN SLD: Instructional strategies, materials, and evaluation techniques for teaching students with learning disabilities. Field experience (20 hrs.). Prerequisite: See advisor. 4 qtr. hrs.

EDT 595. STUDENT TEACHING — SLD: Full-time supervised and evaluated teaching in an SLD classroom. Student is to demonstrate the knowledge, skills, attitudes, and values of a beginning SLD teacher. Prerequisite: See advisor 4 qtr. hrs.

EDT 596. BEHAVIOR MANAGEMENT: Principles and methods of observing, recording, measuring, and managing human behavior with emphasis for students with mental retardation, learning disabilities, and behavior disorders. Prerequisite: See advisor. 4 qtr. hrs.

EDT 597. SPECIAL TOPICS — SPECIAL EDUCATION: A seminar that permits students to focus on topics of current issues that are not covered in the regular curriculum. 1-4 qtr. hrs.

EDT 604. SPECIAL TOPICS IN VOCATIONAL EDUCATION: A course which permits teachers as individuals or in small groups to examine with a faculty member current topics of interest in vocational education. 3-4 qtr. hrs.

EDT 607. VOCATIONAL BUSINESS CONTENT AND METHOD: A qualifying course for certification. Study of the objectives, curriculum, student-teacher relationship, community needs, equipment, facilities, public relations, youth groups, advisory committees, vocational reports, and PRIDE. Prerequisites: See advisor. 6 qtr. hrs.

EDT 611. ECONOMICS EDUCATION: A course designed to acquaint educators with basic economic concepts through the discussion of current economic issues. Attention will be given to instructional strategies and curriculum for teaching economic awareness. 2-4 qtr. hrs.

EDT 612. CAREER EDUCATION — COMMUNITY INVOLVEMENT: Curriculum, planning, instructional methods, materials, and evaluation techniques for facilitating career awareness and choices in students with varied needs and abilities; special emphasis on use of community resources. 3 qtr. hrs.

EDT 619. ART IN THE ELEMENTARY SCHOOL: Curriculum, planning, diagnosis, instructional methods, and evaluation techniques for teaching art to students with varied needs and abilities. Clinical experience (2 hrs.). 3 qtr. hrs.

EDT 620. ADVANCED PAINTING INSTRUCTION: This course is designed for art educators who have completed EDT 619. Course will enable art educators to learn techniques for teaching students with a good painting background. 1-4 qtr. hrs.

EDT 622. SPECIAL TOPICS: ART EDUCATION: Seminar which permits art educators to focus on topics of current interest not covered in the regular curriculum. 1-4 qtr. hrs.

EDT 626. MUSIC IN THE ELEMENTARY SCHOOL: Curriculum, planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching music to students with varied needs and abilities. 3 qtr. hrs.

EDT 627. VOCAL MUSIC IN HIGH SCHOOL: Study of instructional content, instructional strategies, etc. for the vocal music educator in the secondary school. 4 qtr. hrs.

EDT 628. SPECIAL TOPICS: MUSIC EDUCATION: A seminar in which current issues, problems, etc. are studied by music educators. 1-4 qtr. hrs.

EDT 634. RESEARCH AND MATERIALS IN SCIENCE INSTRUCTION: Study of research in contemporary science instruction, materials, and curriculum. 4 qtr. hrs.

EDT 635. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL: Planning, diagnosis, instructional methods, materials, and evaluation techniques for teaching social studies to students with varied needs and abilities. Clinical and field experience (30 hrs.). Prerequisite: EDT 528. 4 qtr. hrs.

EDT 636. RESEARCH AND MATERIALS IN MATHEMATICS INSTRUCTION: Study of research in contemporary mathematics instruction, materials, and curriculum. 2-4 qtr. hrs.

EDT 637. TEST CONSTRUCTION AND MEASUREMENT: Study of the basic elements of constructing and analyzing tests, using simple statistical procedures for evaluating students, preparing and evaluating test items and interpreting standardized test scores. 2 qtr. hrs.

EDT 638. EDUCATIONAL STATISTICS: Study of basic statistics used to describe groups of inferential statistics for determining parameters in observed samples, and of formulating valid inferences and interpretations. Prerequisite: EDT 503. 4 qtr. hrs.

EDT 639. EDUCATIONAL RESEARCH DESIGN: Study of the techniques for organizing and managing an educational research project. Designed to assist students in setting up their research project. Prerequisite: EDT 503. 2 qtr. hrs.

EDT 640. INTERNSHIP IN EDUCATIONAL RESEARCH AND EVALUATION: Participation in actual school-related research or evaluation activities in the Office of Educational Services, in elementary or secondary schools, or in higher education. Emphasis is on all activities of research and evaluation from conceptualization to final reporting. Prerequisite: EDT 639. 4-8 qtr. hrs.

EDT 645. INDIVIDUAL STUDY IN TEACHING: An opportunity for students (independently or in a small group) to investigate an area normally not contained in existing courses. (With approval of advisor.) 1-4 qtr. hrs.

EDT 646. SPECIAL TOPICS IN TEACHING: Issues of current national or regional interest to teachers (i.e. accountability, testing of teachers, etc.) are studied. 1-4 qtr. hrs.

EDT 647. SPECIAL TOPICS IN FAMILY AND SCHOOL: Presentation and evaluation of methods of improving the communication between the home and school. 2-4 qtr. hrs.

**EDT 648. TECHNIQUES IN HOSPITAL INSTRUCTION:** Planning, instructional methods (i.e., formal classes, clinical work, on-the-job training), materials, and evaluation techniques for providing instruction to adult learners in hospitals and other allied health facilities. *1-4 qtr. hrs.*

**EDT 650. CURRENT INNOVATIONS IN EDUCATION:** Presentation, examination, and evaluation of recent trends in curriculum and instructional strategies in elementary and secondary schools. No Prerequisites. *4 sem. hrs.*

**EDT 654. TEACHING IN CATHOLIC SCHOOLS:** Study of aims, rationale, curriculum, methodologies in light of Catholic theology and philosophy. *3 qtr. hrs.*

**EDT 655. COLLEGE TEACHING SEMINAR:** To assist graduate teaching assistants and beginning college teachers in acquiring information, understandings, and skills which are seen as important components of effective teaching; to provide experienced college faculty with a means of professional development. *1-4 qtr. hrs.*

**EDT 660. STUDENT TEACHING — OUTDOOR EDUCATION:** Full time supervised and evaluated teaching in an outdoor education facility. Student is required to demonstrate the knowledge, skills, attitudes, and values required of a beginning outdoor education teacher. Prerequisite: Student teaching in major program area. *4 qtr. hrs.*

**EDT 662. DISCIPLINE SKILLS IN THE CLASSROOM:** Study of selected theories and strategies to improve student behavior for academic success. *3-4 qtr. hrs.*

**EDT 664. SUPERVISION OF STUDENT TEACHING:** Demonstration of procedures and use of instruments to determine and guide the student teacher's progress. *3 qtr. hrs.*

**EDT 670. MASTER'S PROJECT:** The culminating course in the Teacher Education Program. Individually or with a small group of students, the student undertakes a demonstration, evaluation, or research project in the area of the student's concentration. An individual full-time faculty member in the Department of Teacher Education acts as advisor. EDT 500, 502, 503 and at least three-fourths of concentration courses need to have been completed prior to registration for EDT 670. See Department of Teacher Education's *Master's Project Handbook* for more information. *5 qtr. hrs.*

**EDT 803. RESEARCH I:** A research course for students in the Educational Specialist program. Prerequisite: EDT 503. *3 qtr. hrs.*



Gordon Fuchs

Department of Teacher Education, and Toni Moore at Holy Angels Elementary School

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# **X SCHOOL OF ENGINEERING**

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Gordon A. Sargent, Dean

Gary A. Thiele, Associate Dean and Director of  
Graduate Engineering Studies and Research

The School of Engineering offers programs leading to master's and doctor's degrees in various areas of engineering. These graduate programs permit both departmental and interdisciplinary study to meet the specialized and continuing educational needs of the engineer. Sufficient flexibility allows the student to specialize or to pursue a broad field of study. Current graduate programs in the School of Engineering lead to the following degrees:

Master of Science in Aerospace Engineering  
Master of Science in Chemical Engineering  
Master of Science in Civil Engineering  
Master of Science in Electrical Engineering  
Master of Science in Electro-Optics  
Master of Science in Engineering  
Master of Science in Engineering Management  
Master of Science in Materials Engineering  
Master of Science in Mechanical Engineering  
Master of Science in Management Science

Doctor of Engineering  
Major in Aerospace Engineering  
Major in Electrical Engineering  
Major in Materials Engineering  
Major in Mechanical Engineering

Doctor of Philosophy in Engineering  
Major in Aerospace Engineering  
Major in Electrical Engineering  
Major in Materials Engineering  
Major in Mechanical Engineering

Programs and the courses appropriate to each of these degrees are described later in this chapter under subject designations, which are alphabetical.



## **ASSISTANTSHIPS AND FELLOWSHIPS**

Assistantships and fellowships are available at the University of Dayton for the encouragement of graduate work and the promotion of research. These are administered by the academic departments. Detailed information relative to application may be secured from the director of graduate engineering studies.

## **MASTER'S DEGREE REGULATIONS**

### **Admission Requirements**

To be considered for admission to graduate study in the School of Engineering a student must have received an undergraduate degree with emphasis in engineering, physics, chemistry, or applied mathematics. Part of the normal qualification for regular admission is graduation from an accredited engineering curriculum with 3.0 or better cumulative grade point average based on a 4.0 grading system. Those with lower grade point averages will be considered for acceptance on a probationary status, in which case particular attention will be given the last 60 semester hours of their undergraduate programs, to recommendations, and to engineering experience. They may also be required to take a limited amount of undergraduate work. Students who have degrees in physics, chemistry, applied mathematics or related sciences are encouraged to apply, but they too may be required to take a limited amount of undergraduate work to complete their preparation for graduate study in the School of Engineering. Students are expected to have some competence in computer programming and the engineering sciences, and to be familiar with the engineering design process. In addition, there may be special departmental requirements. The minimum mathematics requirement for admission is three semester hours in differential equations.

### **Unclassified Status**

Students may also be accepted in unclassified graduate status. They will be considered as students of the School of Engineering who have not been admitted to a graduate degree program. A student can transfer a maximum of only two courses taken in this status to a program of study for a degree without pre-enrollment approval from the director of graduate engineering. An unclassified student planning to seek a degree should complete an application for graduate study to assure that the courses taken are acceptable and compatible with degree requirements.

### **Advising**

Each candidate for the master's degree shall be assigned to an advisor by the departmental chairperson or the program director. The advisor shall be agreed upon by the student and approved by the director of graduate engineering. The duties of the advisor are to assist the student in the preparation of a plan of study and to advise the student during graduate work. An advisor should be appointed prior to initial registration for graduate studies but no later than the end of the first semester. A change of advisor at a later date is permissible upon the request of the student and approval of the departmental chairperson or program director and the director of graduate engineering.

## **PROGRAM REQUIREMENTS**

### **Plan of Study**

The individual plan of study for the degree shall include the specific courses the student is expected to complete and reflect all other requirements of the particular master's degree being sought. The plan of study must be filed with the director of graduate engineering prior to the pre-enrollment date for the 16th graduate semester hour. All copies must be approved by the advisor, the program director, and the director of graduate engineering.

### **Thesis**

Each student whose plan of study requires a thesis must prepare the thesis in accordance with the general format outlines in the *Manual for the Preparation of Graduate Theses and Dissertations*, copies of which are available in the Office for Graduate Studies, 200 St. Mary's Hall. In general, the thesis will be based on work accomplished in research in the primary area of study. Joint authorship is not permitted. A regular grade will be assigned upon satisfactory completion of the thesis and will be included in the final cumulative grade point average.

### **Oral and Written Examinations**

A final examination is required at the completion of the thesis. The examination may be oral or written or both. It must be given by a committee of no fewer than three. A student who fails to pass it cannot be given another examination in the same semester. No student shall be allowed to take the examination more than three times.

### **Academic Standards**

Graduate students are expected to do high caliber work at all times and to demonstrate continuing progress toward the degree which requires that students maintain a minimum average grade of B (3.0) in course work with no more than two grades of C permitted. Students who fail to meet these requirements are either placed on academic probation or dismissed from the program.

## **FIVE-YEAR MASTER'S PROGRAM**

Undergraduate students who have shown above average scholastic performance during their first three years of undergraduate work are eligible to pursue the five-year master's program. This program allows the senior engineering student the opportunity of taking selected graduate courses, making it possible to complete the requirements for a master's degree with only two semesters of additional work beyond the bachelor's degree. Undergraduate students who are interested in this program should contact their department chairperson during the last semester of their junior year.

## **DOCTOR'S DEGREE REGULATIONS**

The School of Engineering offers programs leading to two degrees at the doctoral level, the Doctor of Philosophy in Engineering and the Doctor of Engineering. The programs are restricted to those who have demonstrated

superior abilities in scholarship and research. The Doctor of Philosophy in Engineering (Ph.D.) is granted in recognition of high achievement in scholarship and independent research. Graduate programs leading to the Ph.D. degree currently encompass major fields of study in Aerospace, Electrical, Materials, and Mechanical Engineering. The Doctor of Engineering (D.E.) granted in recognition of high achievement in scholarship and superior ability to apply the fundamentals of Engineering to the solution of technical problems, is comparable in rigor to the Ph.D. It requires a broad program of course work, a year of internship in Engineering, and a practice-oriented dissertation. These last two can be accomplished at the same time. The areas of concentration for the D.E. are aerospace, electrical, materials, and mechanical engineering with major support from chemical engineering, civil engineering, and engineering management. Interdisciplinary study and applied research activities are required.

## **PROGRAM REQUIREMENTS FOR THE *Ph.D.* AND *D.E.* DEGREES**

### **Semester-Hour Requirements**

The minimum time required for the Ph.D. or D.E. degree is six semesters of full-time graduate study (a minimum of 90 semester hours) beyond the bachelor's degree, or four semesters of full-time graduate study (a minimum of 60 semester hours) beyond the master's degree. This includes the credit for the doctoral dissertation *with either degree* (a minimum of 30 semester hours). Registration for the dissertation hours is the same as for other courses; however, only those students who have passed the candidacy examination are eligible. A minimum of 48 semester hours must be taken at this university. Also, a minimum of 12 semester hours in graduate mathematics beyond the bachelor's degree is required for both doctoral degrees. The following specific requirements may also apply:

*For the Ph.D.*, a student must complete a minimum of 30 semester hours, excluding the dissertation credit, in the major area of study beyond the bachelor's degree.

*For the D.E.*, a student is required to have a major and minor area of study. The minor must be in an area outside the major field. A minimum of 21 semester hours in the major and 12 semester hours in the minor is required beyond the bachelor's degree.

For either degree, the student must satisfactorily complete a specified number of semester hours of course work with a 3.0 or better cumulative grade point average (based on a 4.0 grading system). However, a grade of "F" in any individual course may be grounds for dismissal from the program. The student must also:

- (1) pass the candidacy examination,
- (2) meet the period of concentrated study requirements,
- (3) complete an acceptable dissertation,
- (4) complete the tools of research requirement,
- (5) demonstrate the ability to accomplish independent study,
- (6) pass a final examination, and
- (7) complete other requirements as specified by the advisory committee and the Graduate School of Engineering.

## **Admission**

Admission means only that the student will be permitted to enroll for graduate courses. It does not necessarily imply that the student will be admitted to a program leading to a doctor's degree or will be able to achieve the Ph.D. or the D.E.

Normally, a student must earn a master's degree in engineering or science before being granted permission to continue graduate work for the doctorate. Outstanding students, however, may be permitted to work for either doctoral degree directly without the master's degree.

## **Notice of Intention**

Before taking additional courses after completing the requirements for a master's degree or equivalent graduate hours, a student who expects to work to the Ph.D. or D.E. is required to file a "Notice of Intention" in the Graduate School of Engineering. Unless this is accomplished, the courses taken beyond the master's degree requirement may not be accepted toward a doctoral degree. The Notice of Intention must be filed prior to mid-term of the first semester of enrollment. The proper form may be obtained in the Graduate School of Engineering.

## **Temporary Advisor**

After receipt of the notice of intention of a student to become a candidate for either the Ph.D. or the D.E., and upon recommendation of the program director, the director of graduate engineering will designate a member of the graduate faculty to serve as temporary advisor to the student and assist in the initial selection of courses for the first semester of enrollment.

## **Qualifying Examination**

After the completion of the master's degree or 30 semester hours of graduate study, the student will take a qualifying examination (which may be waived for the exceptional student). The purpose of the examination is to determine the student's qualifications to continue graduate study and to assist the advisory committee in planning the program of study. The examination shall be written and oral. It shall test the student's mastery of the subject matter of graduate courses taken and the student's ability to conduct research, to reason, and to integrate and express knowledge. The student is required to provide evidence of personal research accomplishments (e.g., thesis, research projects, science and engineering technical reports) as part of the examination. The temporary advisor will be responsible for administering the qualifying examination.

## **Advisory Committee**

Before the end of the first semester, the student should consult with the program director and select a major professor to serve as the chairperson of the advisory committee and to direct the research. The chairperson will be a member of the School of Engineering graduate faculty. An advisory committee of at least three graduate faculty members from the School of Engineering will

then be recommended for approval to the director of graduate engineering. The composition of the committee will generally reflect the student's area of course study and research interest. At least one person having graduate faculty status will be appointed by the director of graduate engineering. The duties of the advisory committee shall consist of: (1) advising the student, (2) assisting the student in preparing the complete program of study, (3) preparing and administering the candidacy examination, (4) assisting in planning and conducting research, (5) approving the dissertation, and (6) conducting and reporting the results of the final examination. Appointment of additional members of the committee from outside the School of Engineering (i.e., other university faculty, adjunct professors, prominent researchers in industry or government) is encouraged. The majority of the committee, however, must be members of the School of Engineering graduate faculty. A dissertation advisor other than the chairperson may be appointed by the advisory committee.

### **Plan of Study**

The plan of study shall include all the graduate work the student is expected to complete as determined by his advisory committee. The plan of study is to be submitted to the School of Engineering before the end of the first semester or prior to the pre-enrollment date for the 16th graduate hour beyond the master's degree or its equivalent. The plan shall include the specific courses and all other requirements (seminars, tools of research, research, etc.) which the student is expected to complete, indicating the time and manner in which these requirements are to be met.

### **Tools of Research**

The needs of the student may differ with the educational objectives chosen. Therefore, the tools of research requirement will be determined by the advisory committee and approved by the department chairperson or the program director. One from the following will be selected:

1. Command of one approved language, as evidenced by a satisfactory score on the Graduate Foreign Language Tests (GFLT) in French, German or Russian.
2. Completion of 6 semester hours of selected and approved 400-level or higher courses in Computer Science and/or instrumentation measuring techniques with at least a B average.
3. Completion of 6 semester hours of graduate courses in a defined area of Humanities and/or Social Sciences, related to the program of study objectives with the grade of B or higher.

Courses taken in completing the tools of research requirement will not carry credit toward the degree. The method selected in satisfying this requirement is to be listed in the plan of study. This requirement must be satisfied prior to the candidacy examinations.

### **Period of Concentrated Study**

After a student has filed a notice of intention, a period of concentrated study must be completed in order to be considered for the candidacy examination.

This requirement can be met in either of two ways:

1. During three consecutive semesters, the student completes a minimum of 21 semester hours of graduate course work.
2. In any two of three consecutive semesters, the student completes a minimum of 18 semester hours of graduate course work.

### **Candidacy Examination**

The candidacy examination for either the Ph.D. or the D.E. is generally to be taken when most of the course work, as outlined on the approved plan of study, has been completed. Its purpose is to determine the student's eligibility to become a candidate for the doctor's degree. The examination is comprehensive, covering the entire area of the student's graduate study. It will be both written and oral. The oral portion must follow the written portion by a minimum of two weeks. At least three members of the School of Engineering graduate faculty must participate in the preparation and the administering of the examination under the direction of the advisory committee. The director of graduate engineering has the right to appoint additional members to the examining committee, and must be informed of the date and place of the examinations and the membership of the committee at least two weeks before the examinations are given.

As part of the examination, the student must have completed a proposal outlining in detail the proposed area of dissertation study and research for the Ph.D. or of the applied research dissertation project for the D.E. The proposal should clearly show the review of the literature in the area, the need for and the uniqueness of the research and/or investigation, the general approach to accomplishing the effort, results expected, detailed costs, the laboratories and/or other facilities needed, and a schedule of completion. In addition, the proposal by the candidate for the D.E. will explain the interdisciplinary role of the investigation. The student in either degree program must make a copy of this proposal available to each committee member prior to the written examination.

**NOTE:** *the University of Dayton is not obligated to provide financial support for the research or investigation.*

The student must pass all parts of the examination (proposal, written examination, and oral examination) to be admitted to candidacy. The student is considered to have passed only when the decision of the examining committee is unanimous. All members must sign the examination report form with an indication of their decision noted prior to its being submitted to the director of graduate engineering. If any part of the examination is failed, the student will be notified in writing of the conditions from another examination. No student will be permitted to take any part of the examination more than twice. A second examination may not be given earlier than four months after failure. Examinations will be retained by the chairperson of the advisory committee.

A student must be admitted to candidacy at least six months prior to receiving the doctor's degree.

### **Internship for D.E. Degree**

The D.E. internship is a minimum of one year of high level practicing

engineering experience, and is normally conducted after the student has passed the candidacy examination. The internship phase of the program must be fully described in the proposal submitted as part of the candidacy examination. The candidate's internship advisor (generally the supervisor at the student's interning organization) will be added as a member of the advisory committee. The internship, as part of the D.E. program of study, must be approved by the candidate's advisory committee, program director, and the director of graduate engineering. From 15 to 21 semester hours can be credited for the internship as part of the dissertation requirement for the Doctor of Engineering.

## Dissertation

A dissertation is required of each doctoral candidate who has passed the candidacy examination. The dissertation topic will be determined by the student in consultation with the advisor and approved by the advisory committee, the program director, and the director of graduate engineering. The *Ph.D.* dissertation presents the results of the student's research investigation. It is expected to make an original contribution to technical knowledge; be of sufficient importance to merit publication, and result in a manuscript suitable for submission to an appropriate journal. The *D.E.* dissertation presents the results of an original investigation as applied to engineering practice. Normally, this will be related directly to the candidate's internship or problems relating to engineering experience or work. It must be a significant contribution of independent engineering work to merit a doctoral level publication. A manuscript in suitable form for submission to an appropriate journal must be submitted to the graduate school of engineering along with the dissertation.

The dissertation will be prepared in accordance with instructions outlined in the Guide for Preparation of Dissertation, copies of which are available in the graduate engineering office.

The first draft of the dissertation should be in the hands of the advisor a minimum of six weeks before the end of the semester the degree is sought. Four copies of the dissertation in final form, the dissertation, the journal manuscript, and an abstract not to exceed 350 words must be submitted to the graduate school of engineering at least three weeks before the end of the semester in which the degree is sought. These copies must bear the written approval of the advisor. The original copy of the dissertation and two copies of the abstract shall be filed in the Roesch Library one week prior to the end of the semester.

All doctoral dissertations are microfilmed by the University Microfilm, Inc., Ann Arbor, Michigan. The candidate must sign an agreement with the University Microfilms, Inc., which authorizes this firm to sell copies of the dissertation. Microfilmed dissertations may be copyrighted by the candidate. Fees will be assessed for the cost of copyrights.

The student must obtain approval from his advisory committee to undertake all or part of his dissertation in absentia. A report requesting this permission must be submitted to the director of graduate engineering outlining in detail the relationship between the advisor and the candidate and the name and background of the person who will directly advise the candidate during the

accomplishment of this independent research. This person will be added to the advisory committee.

Candidates must be registered for a minimum of two semester hours every semester during their candidacy including the semester the final examination is taken.

### **Final Examination**

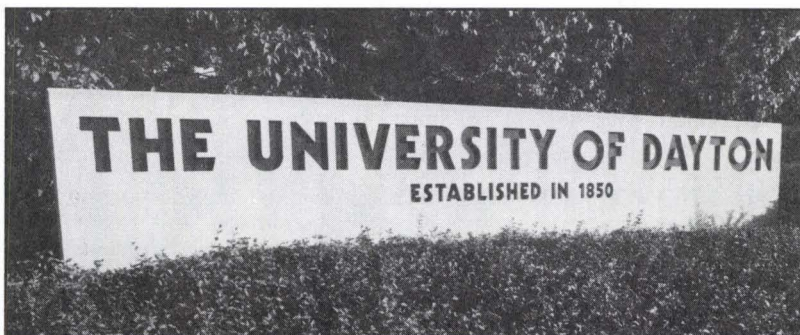
After the dissertation has been accepted by the graduate engineering office, but no earlier than six months after the successful candidacy examination, the candidate shall take a final oral examination to demonstrate to the examining committee that all the capabilities for which the doctor's degree is awarded have been met. This is primarily the defense of the dissertation, though it need not be confined exclusively to it. The examination is open to all members of the University of Dayton faculty and student body. At least ten days prior to the date of the examination, the candidate must have provided the committee with copies of the dissertation in final form and must have disseminated an announcement of the final examination to interested organizations.

The final examining committee normally includes the members of the candidate's advisory committee, with the advisor acting as chairperson. The final examining committee shall consist of at least four members of the graduate faculty, at least one of whom is not directly involved in the program concerned and is appointed by the director of graduate engineering. The director of graduate engineering reserves the right to appoint additional committee members and must be informed of the place and time of the final examination at least ten days in advance.

After the examination, the committee will report its decision to the director of graduate engineering. In order to be satisfactory, the report of the examining committee must be unanimous and must be signed by all members. If the candidate fails by only one vote, the case will be referred to the graduate study committee for appropriate action.

### **Time Limit**

Students are expected to complete the requirements for the doctor's degree within five years after the candidacy examination has been passed. Failure to complete the requirements means that admission to candidacy will be cancelled.





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## AEROSPACE ENGINEERING (AEE)

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Franklin E. Eastep, Director of the Program

Aerospace Engineering is a major concentration for both the Doctor of Philosophy in Engineering and the Doctor of Engineering. See Doctor's Degree Regulations in the introductory section of this chapter and consult with the director of the program.

### PROGRAM REQUIREMENTS

The program of study leading to the Master of Science in Aerospace Engineering must include a minimum of 30 semester hours of credit consisting of the following:

1. Twelve semester hours in the major area. Major areas of study include Aerodynamics, Aircraft Propulsion, Aircraft Structures, and Flight Vehicle Dynamics.
2. Twelve semester hours of core electives. Core electives will be selected from current course offerings which best satisfy the student's requirements and meet with the advisor's approval. At least one mathematics course is strongly recommended.
3. Six semester hours of research on an approved project. Research projects may be replaced by 6 semester hours of additional course work with the approval of the advisor and the program director.

See also Master's Degree Regulations in the introductory section of this chapter and consult with the director of the program.

### COURSES OF INSTRUCTION

**AEE 500. INTRODUCTION TO NUMERICAL METHODS IN AEROSPACE ENGINEERING:** Numerical analysis topics include the solution of systems of linear and nonlinear algebraic equations; matrix eigenvalue problems; ordinary differential equations; optimization techniques; numerical integration and interpolation. Engineering applications presented. Computer programming required. *3 sem. hrs.*

**AEE 501. ADVANCED AERODYNAMICS I:** Fundamentals of aerodynamics including viscosity and compressibility phenomena for subsonic, supersonic, and transonic flow. Emphasis on force and moment determination for bodies, including theory of lift. *3 sem. hrs.*

**AEE 502. ADVANCED AERODYNAMICS II:** Advanced analytical development of compressible aerodynamics as applied to lifting surfaces and slender bodies. Approximations to lifting surface theory and numerical solution. Introduction to unsteady aerodynamics. Prerequisite: AEE 501. *3 sem. hrs.*

AEE 503. INTRODUCTION TO CONTINUUM MECHANICS: Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics. Prerequisite: EGM 303.

3 sem. hrs.

AEE 508. AIRCRAFT PERFORMANCE AND CONTROL: Elementary development of aircraft equations of motion; performance in level flight; climbing and descending performance; turning performance; takeoff and landing performance; static stability and control in all three axes. Prerequisite: AEE 501.

3 sem. hrs.

AEE 511. AIRCRAFT DESIGN: Preliminary design of aircraft, including layout, weight and size estimates, wing section and planform selection, determination of configuration aerodynamics, engine and inlet sizing, corrections to propulsion data, refined fuel estimates, weight and balance, stability and control, and performance determination. Prerequisite: AEE 508.

3 sem. hrs.

AEE 513. PROPULSION: Principles of propulsive devices, aerothermodynamics, diffuser and nozzle flow, energy transfer in turbo-machinery, turbojet, turbo-fan, prop-fan engines, turbo-prop and turboshaft engines. RAM and SCRAM jet analysis and a brief introduction to related materials and air frame-propulsion interaction. Prerequisite: MEE 418.

3 sem. hrs.

AEE 515. CONDUCTION HEAT TRANSFER: Steady state and transient state conduction. Evaluation of temperature fields by formal mathematics, numerical analysis, and analogic experiments.

3 sem. hrs.

AEE 516. CONVECTION HEAT AND MASS TRANSFER: Development of governing differential equations for convection. Methods of solution including similarity methods, integral methods, superposition of solutions, eigen-value problems. Turbulent flow convection; integral methods, eddy diffusivities for heat and momentum. Extensions to mass transfer. Prerequisite: MEE 410.

3 sem. hrs.

AEE 517. RADIATION HEAT TRANSFER: Fundamental relationships of radiation heat transfer. Radiation characteristics of surfaces. Geometric considerations in radiation exchange between surfaces. Emissivity and absorptivity of gases. Introduction to radiative exchange in gases. Prerequisite: MTH 403.

3 sem. hrs.

AEE 521. VEHICLE DYNAMICS: Dynamics of flight vehicles that emphasize the fundamental theory of flight and its application to aerospace systems. Static and dynamic stability including the characteristic longitudinal and lateral perturbation motions about the equilibrium state. Prerequisite: AEE 501.

3 sem. hrs.

AEE 527. AUTOMATIC CONTROL THEORY: Analysis and synthesis of feedback control systems; including hydraulic, pneumatic, mechanical and electrical systems. Frequency response; linear state space techniques; stability analysis; nonlinear system analysis and Liapunov stability. Prerequisite: ELE 432 or MEE 435 or equivalent.

3 sem. hrs.

AEE 532. NOISE CONTROL: Physics of sound propagation. Physiological and legal aspects of sound. Measurement and analysis of sound and vibrations. Vibration and sound control techniques, source modifications, path modifications, receiver modification. Acoustic considerations in machine design. Prerequisite: MTH 219.

3 sem. hrs.

AEE 535. MECHANICAL VIBRATIONS: Multi-degree of freedom systems. Lagrange's equations, transient vibrations, vibrations of continuous systems. Matrix and numerical methods. Introduction to finite element method; to nonlinear vibrations. Prerequisite: MEE 319.. Corequisite: AEE 503. 3 sem. hrs.

AEE 536. RANDOM VIBRATIONS: Introduction to statistics, time and frequency domain analysis, excitation-response relations for linear systems, digital spectral analysis, approximations for narrow band processes, accuracy of measurements, applications in vibrations, vehicle dynamics, fatigue, etc. 3 sem. hrs.

AEE 538. INTRODUCTION TO AEROELASTICITY: The study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls. 3 sem. hrs.

AEE 543. MECHANICS OF COMPOSITE MATERIALS: Analytical models are developed for predicting the mechanical and thermal behavior of fiber reinforced composites as a function of constituent material properties. Both continuous and discontinuous fiber reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micromechanics, and lamination theory. 3 sem. hrs.

AEE 544. STRUCTURAL BEHAVIOR OF COMPOSITES: Comprehensive treatment of laminated plates and cylindrical shells. Bending, buckling, and vibration analysis are considered. Various orders of theory and their range of parametric application are emphasized. Thermal stresses are also considered. Prerequisite: AEE 543 or consent of instructor. 3 sem. hrs.

AEE 546. FINITE ELEMENT ANALYSIS I: Fundamentals of the Finite Element Method; interpolation functions; derivation of finite elements for bars, beams, plates, shells; isoparametric solid finite elements; isoparametric shell finite elements; natural vibration; elastic stability. Prerequisite: EGM 503 or 533. 3 sem. hrs.

AEE 547. FINITE ELEMENT ANALYSIS II: Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature. Prerequisite: EGM 546. 3 sem. hrs.

AEE 551. VISCOUS FLOW: Fundamentals of viscous flow. Navier-Stokes and boundary layer equations. Exact and approximate solutions of these equations using modern computational procedures for both laminar and turbulent flows. Prerequisite: AEE 503. 3 sem. hrs.

AEE 553. COMPRESSIBLE FLOW: Fundamental equations of compressible flow. Introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one-dimensional motion and shock tube theory. Method of surface singularities. Prerequisite: AEE 503. 3 sem. hrs.

AEE 554. TRANSONIC AERODYNAMICS: Inviscid theory related to planar flows, axisymmetric flow and shock free solutions. Viscous consideration for compressible boundary layers and flow separation and reattachment. Numerical methods of relaxation, time dependent, gradient dependent and integral solutions. Consideration, limitation and correlation of wind tunnel and flight testing. Design of supercritical wings. Prerequisite: AEE 503. 3 sem. hrs.

**AEE 555. TURBULENCE:** Random variable theory, Fourier transforms, power spectral density methods. Description of atmospheric turbulence, discrete gusts, homogeneous isotropic turbulence; gusts in several dimensions; power spectrum of atmospheric turbulence; turbulence due to trailing vortices. Air vehicle response to turbulence, output power spectrum, gust alleviations. Clear air turbulence. Unsteady aerodynamics.

*3 sem. hrs.*

**AEE 556. HYPERSONIC AERODYNAMICS:** Hypersonic prediction techniques, similarity rules, Newtonian impact theory, high temperature equilibrium properties of gases; wake characteristics; heat transfer, chemical kinetics and reacting gas flows, simulation and testing techniques. Prerequisite: AEE 503.

*3 sem. hrs.*

**AEE 558. COMPUTATIONAL AERODYNAMICS:** Numerical solution to Navier-Stokes equations and approximations such as the boundary layer equations for air-flow about a slender body. Numerical techniques for the solution of the transonic small disturbance equations. Numerical determination of fluid instabilities. Prerequisites: AEE 551 or consent of instructor.

*3 sem. hrs.*

**AEE 565. FUNDAMENTALS OF COMBUSTION:** Heat of combustion and flame temperature calculations; rate of chemical reaction and Arrhenius relationship; theory of thermal explosions and concept of ignition delay and critical mass; phenomena associated with hydrocarbon-air combustion; specific applications of combustion.

*3 sem. hrs.*

**AEE 566. COMBUSTION THEORY OF DETONATION:** Rankine-Hugoniot relationships and flame propagation rate in pre-mixed gas systems; turbulent flames and the well-stirred reactor; theory of diffusion flames; fuel droplet combustion; steady burning of solid materials; ignition and flame spreading across solid materials.

*3 sem. hrs.*

**AEE 570. FRACTURE MECHANICS:** Application of principles of fracture mechanics to fatigue and fracture in engineering structures. Prerequisite: MAT 502 or consent of instructor.

*3 sem. hrs.*

**AEE 580. AEROSPACE ENGINEERING PROJECT:** Student participation in an aerospace research, design or development project under the direction of a project advisor. The student must show satisfactory progress as determined by the project advisor and must present a written report at the conclusion of the project.

*3-6 sem. hrs.*

**AEE 590. SELECTED READINGS IN AEROSPACE ENGINEERING:** Directed readings in the designated area to be arranged and approved by the student's advisor and the program director. May be repeated.

*1-3 sem. hrs.*

**AEE 595. SPECIAL PROBLEMS IN AEROSPACE ENGINEERING:** Special assignments in aerospace engineering subject matter to be approved by the student's faculty advisor and the program director.

*1-6 sem. hrs.*

**AEE 599. THESIS**

*3-6 sem. hrs.*

**AEE 612. ADVANCED APPLIED AERODYNAMICS:** Optimization of performance and controls, design trade studies, advanced methods for performance predictions, wind tunnel testing, flight testing, computer system design and simulation; analysis and validation of models and results, including design to cost consideration.

*3 sem. hrs.*

**AEE 622. ADVANCED VEHICLE DYNAMICS:** Advanced topics in vehicle dynamics including the coupling of the elastic degrees of freedom with the rigid body motions. Response to controls, flight in a turbulent atmosphere, human pilots and handling qualities as well as inverse problems. *3 sem. hrs.*

**AEE 624. OPTIMAL CONTROL:** Feedback control, frequency and time domain, stability controllability, and observability; Bode plots, root-loci, Nyquist methods; variational calculus optimization; dynamic programming; Pontryagin's principles; numerical methods for optimal paths; optimal control in presence of noise; aerospace application. *3 sem. hrs.*

**AEE 628. AIRCRAFT FLIGHT CONTROL:** Autopilots, stability augmentation and flight control system analysis and design. Digital control theory and techniques. Prerequisites: AEE 521 and 527. *3 sem. hrs.*

**AEE 690. SELECTED READINGS IN AEROSPACE ENGINEERING:** Directed readings in aerospace engineering to be arranged and approved by the student's advisory committee and the program director. May be repeated. *1-3 sem. hrs.*

**AEE 695. SPECIAL PROBLEMS IN AEROSPACE ENGINEERING:** Special assignments in aerospace engineering. Subject matter to be arranged and approved by the student's advisory committee and the program director. May be repeated. *1-3 sem. hrs.*

**AEE 698. D.E. DISSERTATION:** An original investigation as applied to aerospace engineering practice. Results must be of sufficient importance to merit publication. *1-15 sem. hrs.*

**AEE 699. Ph.D. DISSERTATION:** Research in aerospace engineering. Results must be of sufficient importance to merit publication. *1-15 sem. hrs.*

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## Department of

## CHEMICAL ENGINEERING (CME)

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Ronald A. Servais, Chairperson of the Department

### PROGRAM REQUIREMENTS

The program of study leading to the Master of Science in Chemical Engineering must include a minimum of 30 semester hours of credit consisting of the following:

1. Fifteen semester hours of Chemical Engineering graduate courses, including CME 505 or 507, 521 or 522, 542 or 543, and 581 or 582.
2. Nine semester hours of electives as approved by the advisor and the chairperson of the department.

3. Six semester hours on an approved thesis project; a final examination is required at the completion of the thesis. Upon the request of the student and with the approval of the faculty advisor and chairperson of the department, six hours of additional course work plus three hours of special problem work may be substituted for the thesis.

A final examination is required at the completion of the thesis or course work. See also Master's Degree Regulations in the introductory section of this chapter and consult with the advisor.

## COURSES OF INSTRUCTION

**CME 505. THERMODYNAMICS OF SOLIDS:** Thermodynamic properties of solutions and intermediate phases. Equilibrium behavior of phase mixtures. Representation of multicomponent phase diagram. Experimental determination and prediction of phase diagrams. Prerequisite: MAT 502 or consent of instructor. *3 sem. hrs.*

**CME 507. ADVANCED THERMODYNAMICS:** Entropy balance. Thermodynamics of energy conversion. Mixtures. Equilibria. Current applications. *3 sem. hrs.*

**CME 508. ADVANCED TOPICS IN CHEMICAL ENGINEERING:** Study and discussion of current problems in chemical engineering research. Prerequisites: CME 521, 581, or consent of instructor. *3 sem. hrs.*

**CME 509. INTRODUCTION TO POLYMER SCIENCE:** Introduction to polymers. A largely nonmathematical survey of the field. Prerequisites: college chemistry and calculus. *3 sem. hrs.*

**CME 510. PHYSICAL PROPERTIES OF POLYMERS:** Intensive discussion of the interrelations between molecular and gross physical properties of polymers. Prerequisites: CME 509 or equivalent, background in differential equations. *3 sem. hrs.*

**CME 511. PRINCIPLES OF CORROSION:** Application of electrochemical principles, corrosion reactions, passivations, cathodic and anodic protection, stress corrosion, and high temperature oxidation. *3 sem. hrs.*

**CME 515. STATISTICAL THERMODYNAMICS:** Microscopic thermodynamics; kinetic theory; virial theorem of Clausius; transport phenomena; Gibbs, Boltzman, Bose-Einstein, Fermi-Dirac statistics. Connection between statistical and thermodynamic quantities. Applications to perfect and real gases, liquids, crystalline solids, and thermal radiation. Information theory, irreversible thermodynamics. Prerequisites: CME 305, MTH 219. *3 sem. hrs.*

**CME 521. ADVANCED TRANSPORT PHENOMENA:** Applications of the principles of momentum, heat and mass transfer to steady state and transient problems. Transport in turbulent flow. Boundary layer theory. Prerequisites: CME 324 and 381 or equivalent. *3 sem. hrs.*

**CME 522. ADVANCED TOPICS IN TRANSPORT PHENOMENA:** The equations of change for multicomponent systems. Turbulent mass transport. Interphase transport in multicomponent systems. Macroscopic balances. Prerequisite: CME 325 and 581 or equivalent. *3 sem. hrs.*

**CME 541. PROCESS DYNAMICS:** Mathematical modeling and computer simulation of process dynamics and control for chemical engineering processes. 3 sem. hrs.

**CME 542. CHEMICAL ENGINEERING KINETICS:** Reaction kinetics. Heterogeneous catalytic reactions. Transport processes with fluid-solid heterogeneous reactions. Noncatalytic gas-solid reactions. Catalyst deactivation. Gas-liquid reactions. Prerequisites: CME 406 and 381 or equivalent. 3 sem. hrs.

**CME 543. CHEMICAL REACTOR ANALYSIS AND DESIGN:** Design for optimum selectivity. Stability and transient behavior of the mixed flow reactor. Nonideal flow and balance models. Fixed and fluidized bed reactors. Multiphase flow reactors. Prerequisites: CME 406 and 381 or equivalent. 3 sem. hrs.

**CME 581. ADVANCED CHEMICAL ENGINEERING CALCULATIONS I:** Applications of ordinary and partial differential equations to engineering problems. Classical methods of solution. 3 sem. hrs.

**CME 582. ADVANCED CHEMICAL ENGINEERING CALCULATIONS II:** Analyses and solutions of engineering problems described by differential equations. Numerical methods of solution. 3 sem. hrs.

**CME 595. PROCESS MODELING:** Mathematical description of physical and chemical processes, solution methods, and prediction interpretation. Engineering applications. Prerequisite: CME 582 or equivalent. 3 sem. hrs.



James Snide,  
*Department of Chemical and Materials Engineering.*

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## Department of **CIVIL ENGINEERING (CIE)**

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Fred K. Bogner, Chairperson of the Department

### **PROGRAM REQUIREMENTS**

The program of study for the degree of Master of Science in Civil Engineering, developed in cooperation with an advisor assigned by the department chairperson, must include a minimum of 30 semester hours consisting of the following:

1. Fifteen to eighteen semester hours in Civil Engineering, Engineering Mechanics, and/or thesis-related courses selected from one of the following areas of concentration:
  - Engineering Mechanics
  - Environmental Engineering
  - Soil Mechanics
  - Structural Engineering
  - Transportation Engineering
2. Six to nine semester hours of engineering or basic science electives to be chosen from current course offerings. For the major concentration of Engineering Mechanics, six semester hours of mathematics (MTH 535 and 551) must be selected.
3. Six semester hours of research on a Civil Engineering or Engineering Mechanics thesis (CIE 599, EGM 599). A final oral thesis defense is required upon completion of the thesis. Upon the request of the student, and with the approval of the faculty advisor and the department chairperson, this requirement may be replaced by nine additional semester hours. At least three of the additional hours must be Special Problems (CIE 595, EGM 595).

See also Master's Degree Regulations in the introductory section of this chapter and consult with the advisor.

### **COURSES OF INSTRUCTION**

**CIE 500. ADVANCED STRUCTURAL ANALYSIS:** Frames of variable cross section, arches; flat and folded plates; elastic stability of columns, frames, and plates; cylindrical, spherical, and barrel shells; structural dynamics of beams and frames. Prerequisites: CIE 405, EGM 304. 3 sem. hrs.

**CIE 501. STRUCTURAL ANALYSIS BY COMPUTER:** Review of force and displacement methods. Introduction to direct element and substructure methods. Students write and execute, using computer terminals, their own programs to analyze plane and space trusses, grids, and plane and space frames. Prerequisite: CIE 406. 3 sem. hrs.

**CIE 502. PRESTRESSED CONCRETE:** Discussion of the properties of concrete and prestressing steel. Theory and design of prestressed concrete beams, slabs, columns, frames, ties, and circular tanks. Prerequisite: CIE 407. 3 sem. hrs.



CIE 503. PLASTIC DESIGN IN STEEL: Analysis and design procedures based on ultimate load capacity applied to steel beams, frames, and their connections. Concept of plastic hinge, necessary conditions for the existence of plastic moment, instability, deformations, repeated and reversed loading, and minimum weight design. Prerequisite: CIE 415. *3 sem. hrs.*

CIE 511. EXPERIMENTAL STRESS ANALYSIS: A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gages. Also, photoelasticity, brittle coatings, analogies, structural similitude. Two hours lecture and one three-hour laboratory period per week. Prerequisite: EGM 304. *3 sem. hrs.*

CIE 513. INTRODUCTION TO CONTINUUM MECHANICS: Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics. Prerequisite: EGM 303. *3 sem. hrs.*

CIE 520. ADVANCED SOIL MECHANICS: Treatment of the theories of conventional soil mechanics. Detailed study and analysis of the static and dynamic properties of soils, with applications to foundation behavior. Prerequisite: CIE 312. *3 sem. hrs.*

CIE 524. FOUNDATION DESIGN: Analysis of earth pressure, stability of natural slopes, and bearing capacity of soil; design of spread foundations, pile foundations, beams on elastic foundations, anchored bulkheads, caissons, and cofferdams. Prerequisite: CIE 312. *3 sem. hrs.*

CIE 533. THEORY OF ELASTICITY: Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution; plane stress and plane strain; energy formulations; numerical solution procedures. Corequisite: EGM 503. *3 sem. hrs.*

CIE 534. THEORY OF PLATES AND SHELLS: Theory of plates: small and large displacement theories of thin plates; shear deformation; buckling; sandwich plate theory. Thin shell theory: theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories. Prerequisite: EGM 533. *3 sem. hrs.*

CIE 535. ADVANCED MECHANICAL VIBRATIONS: Review of undamped, damped, natural and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problem, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems. Prerequisites: Computer programming and MEE 319. *3 sem. hrs.*

CIE 539. THEORY OF PLASTICITY: Fundamentals of plasticity theory including: elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures. Prerequisite: EGM 503 or 533. *3 sem. hrs.*

CIE 540. HIGHWAY GEOMETRIC DESIGN: Design controls and criteria, vehicle capacity, sight distance, intersection and interchange design. Prerequisite: CIE 405. *3 sem. hrs.*

CIE 544. **TRAFFIC ENGINEERING:** Characteristics of traffic, including the road user, the vehicle, origin, and destination surveys; traffic regulation, control devices and aids, design, administration, and planning. Prerequisite: CIE 405. 3 sem. hrs.

CIE 546. **FINITE ELEMENT ANALYSIS I:** Fundamentals of the Finite Element Method; interpolation functions; derivation of finite elements for bars, beams, plates, shells; isoparametric solid finite elements; isoparametric shell finite elements; natural vibration; elastic stability. Prerequisite: EGM 503 or 533. 3 sem. hrs.

CIE 558. **TRAFFIC ENGINEERING RESEARCH:** Problems in control or capacity restraints based on studies of local situations. 3 sem. hrs.

CIE 560. **ADVANCED SANITARY ENGINEERING:** Stream pollution control and design of water and waste treatment plants and sewers. Prerequisites: CIE 333, 434. 3 sem. hrs.

CIE 562. **INDUSTRIAL WASTE TREATMENT:** Nature and quality of specific industrial wastes and water supplies, treatment and disposal of industrial wastes. Prerequisites: CIE 333, 434. 3 sem. hrs.

CIE 565. **SANITARY CHEMISTRY:** Principles, techniques, and interpretations of physical, chemical and biological tests related to water, sewage, and industrial wastes. Prerequisite: CHM 124. 3 sem. hrs.

CIE 570. **CIE COMPUTER APPLICATIONS:** Applications of mainframe mini- and micro-computers to the solution of selected Civil Engineering problems, including data analysis, plotting, optimization, and simulation. 3 sem. hrs.

CIE 580. **HYDROLOGY AND SEEPAGE:** The deposition, movement, and infiltration of water as related to the hydrologic cycle and groundwater hydraulics; a study of the theory of flow in porous media with application to dams, excavations, and other foundation problems. Prerequisites: CIE 312, 313. 3 sem. hrs.

CIE 582. **ADVANCED HYDRAULICS:** Problems and study involving open channel flow, draw down curves, hydraulics of dams, spillway, models, and water distribution systems. Prerequisite: CIE 313. 3 sem. hrs.

CIE 595. **SPECIAL PROBLEMS IN CIVIL ENGINEERING:** Special assignments in civil engineering subject matter to be arranged and approved by the student's advisor and the department chairperson. 2-6 sem. hrs.

CIE 599. **THESIS** 3-6 sem. hrs.

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## ENGINEERING MECHANICS (EGM)

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*Non-Civil Engineering majors may select courses from this sequence to form a major area for the Master of Science in Engineering (EGR) program.*

## COURSES OF INSTRUCTION

**EGM 500. INTRODUCTION TO NUMERICAL METHODS:** Numerical analysis topics include the solution of systems of linear and non-linear algebraic equations; matrix eigenvalue problems; ordinary differential equations; optimization techniques; numerical integration and interpolation. Engineering applications presented. Computer programming required. *3 sem. hrs.*

**EGM 501. EXPERIMENTAL STRESS ANALYSIS:** A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gages. Also, photoelasticity, brittle coatings, analogies, structural similitude. Two hours lecture and one three-hour laboratory period per week. *3 sem. hrs.*

**EGM 502. ADVANCED ENGINEERING ANALYSIS:** Detailed analysis of engineering problems using laws of nature, fundamental engineering principles, mathematics, computers and practical experience to construct, resolve and test analytic models of physical events. Emphasis is on the use of the professional engineering approach which includes formulation of the problem, assumptions, plan or method of attack, solving the problem, checking and generalizing results. *3 sem. hrs.*

**EGM 503. INTRODUCTION TO CONTINUUM MECHANICS:** Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics. Prerequisite: EGM 303. *3 sem. hrs.*

**EGM 506. MECHANICAL BEHAVIOR OF MATERIALS:** Description of the state of stress and strain in materials, plastic deformation, fatigue, fracture, creep, and rupture. Prerequisites: MEE 502, or consent of instructor. *3 sem. hrs.*

**EGM 519. ANALYTIC DYNAMICS:** Kinematics, relative motion, constraints and generalized coordinates, Hamilton's principle, Lagrange's equations, variational principles. Applications to particle dynamics and rigid body motion. Prerequisites: EGM 301, MTH 219, or equivalent. *3 sem. hrs.*

**EGM 531. THEORY OF LINEAR VISCOELASTICITY:** The principles of viscoelasticity; Kelvin and Maxwell models of viscoelastic materials; creep and relaxation phenomena; application of hereditary integral and complex compliance; correspondence principle wave propagation and vibrational response. Prerequisites: MTH 219 and EGM 303. *3 sem. hrs.*

**EGM 533. THEORY OF ELASTICITY:** Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution; plane stress and plane strain; energy formulations; numerical solution procedures. Corequisite: EGM 503. *3 sem. hrs.*

**EGM 534. THEORY OF PLATES AND SHELLS:** Theory of plates: small and large displacement theories of thin plates; shear deformation; buckling, sandwich plate theory. Thin shell theory: theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories. Prerequisite: EGM 533. *3 sem. hrs.*

**EGM 535. ADVANCED MECHANICAL VIBRATIONS:** Review of undamped, damped, natural and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problem, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems. Prerequisites: Computer Programming and MEE 319. *3 sem. hrs.*

**EGM 536. RANDOM VIBRATIONS:** Introduction to probability distribution; characterization of random vibrations; harmonic analysis; auto- and cross-correlation and spectral density; coherence; response to single and multiple loadings; Fast Fourier Transform (FFT); applications in vibrations, vehicle dynamics, fatigue, etc. Prerequisites: Computer Programming and MEE 319. *3 sem. hrs.*

**EGM 538. INTRODUCTION TO AEROELASTICITY:** The study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls. *3 sem. hrs.*

**EGM 539. THEORY OF PLASTICITY:** Fundamentals of plasticity theory including: elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures. Prerequisite: EGM 503 or 533. *3 sem. hrs.*

**EGM 543. MECHANICS OF COMPOSITE MATERIALS:** Analytical models are developed for predicting the mechanical and thermal behavior of fiber reinforced composites as a function of constituent material properties. Both continuous and discontinuous fiber reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micromechanics, and lamination theory. *3 sem. hrs.*

**EGM 544. STRUCTURAL BEHAVIOR OF COMPOSITES:** Comprehensive treatment of laminated plates and cylindrical shells. Bending, buckling, and vibration analysis are considered. Various orders of theory and their range of parametric application are emphasized. Thermal stresses are also considered. Prerequisite: EGM 533 or consent of instructor. *3 sem. hrs.*

**EGM 545. COMPUTATIONAL METHODS FOR DESIGN:** Modeling of mechanical systems and structures, analysis by analytical and numerical methods, development of mechanical design criteria and principles of optimum design, selected topics in mechanical design and analysis, utilization of the digital computer as an aid in the design of mechanical elements. *3 sem. hrs.*

**EGM 546. FINITE ELEMENT ANALYSIS I:** Fundamentals of the Finite Element Method; interpolation functions; derivation of finite elements for bars, beams, plates, shells; isoparametric solid finite elements; isoparametric shell finite elements; natural vibration; elastic stability. Prerequisite: EGM 503 or 533. *3 sem. hrs.*

**EGM 547. FINITE ELEMENT ANALYSIS II:** Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature. Prerequisite: EGM 546. *3 sem. hrs.*

**EGM 548. ENERGY METHODS IN SOLID MECHANICS:** Development of fundamental energy principles; virtual displacements, strain energy, Castigliano's theorems, minimum potential energy principles. Applications to engineering problems; redundant structures, buckling, static and dynamic analysis. Prerequisite: EGM 503 or EGM 533. *3 sem. hrs.*

EGM 549. THEORY OF ELASTIC STABILITY: Introduction to stability theory; buckling of plates and shells; influence of initial imperfections; nonlinear analysis; numerical solution methods. Prerequisite: EGM 533. 3 sem. hrs.

EGM 570. FRACTURE MECHANICS: Application of principles of fracture mechanics to fatigue and fracture in engineering structures. Prerequisites: MAT 502 or consent of instructor. 3 sem. hrs.

EGM 590. SELECTED READINGS IN ENGINEERING MECHANICS: Directed readings in a designated area, arranged and approved by the student's faculty advisor and the program director. May be repeated. 1-3 sem. hrs. each.

EGM 595. SPECIAL PROBLEMS IN ENGINEERING MECHANICS: Special topics, arranged and approved by the student's faculty advisor and the program director. 1-6 sem. hrs.

EGM 599. THESIS 3-6 sem. hrs.

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## Department of ELECTRICAL ENGINEERING (ELE)

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Donald L. Moon, Chairperson of the Department

Electrical Engineering is a major concentration for both the Doctor of Philosophy in Engineering and the Doctor of Engineering. See Doctor's Degree Regulations in the introductory section of this chapter and consult with the department chairperson and the director of the program.

## PROGRAM REQUIREMENTS

The program of study leading to the Master of Science in Electrical Engineering must include a minimum of 30 semester hours of credit consisting of the following:

1. Six semester hours in basic and engineering sciences. It is possible to combine six semester hours from separate areas. Selected courses must meet with the approval of the advisor.
2. Nine hours in electrical engineering core courses.
  - ELE 501 Introduction to Digital Systems
  - ELE 509 Analysis of Linear Systems
  - ELE 517 Random Processes in System Theory I.
3. Nine hours in a specialization area approved by the advisor.
4. Six hours on an approved thesis or six hours of additional engineering course work plus a three hour problem course for students who meet the thesis requirement through previous scientific publications along with consent of advisor.

A qualifying exam may be required for acceptance into the program. A final examination is required at the completion of the thesis.

See also Master's Degree Regulations in the introductory section of this chapter, and consult with the advisor.

## COURSES OF INSTRUCTION

**ELE 501. INTRODUCTION TO DIGITAL SYSTEMS:** Combinational Logic Theory: Boolean Algebra, switching devices, MSI functions. Sequential Logic Theory: clock-mode circuits, pulse-mode circuits, incompletely specified circuits, level-mode circuits. Prerequisites: ELE 235 and ELE 313 or equivalents. *3 sem. hrs.*

**ELE 502. NETWORK SYNTHESIS:** Synthesis of linear passive networks using classical pole-zero techniques; conditions for physical realizability approximating network functions and design to meet specific requirements; analysis and synthesis of linear active networks. Prerequisites: ELE 331, 413. *3 sem. hrs.*

**ELE 505. QUANTUM ELECTRONICS — PRINCIPLES:** Principles of quantum theory; classical and quantum statistics; many-particle systems; electromagnetic interactions with materials. Applications to lasers and Q.M. communication theory. Prerequisite: ELE 440 or equivalent. *3 sem. hrs.*

**ELE 506. SOLID STATE DEVICES:** Introduction to the theory of solid state electron devices. Bulk devices, junction devices, devices involving electric, magnetic, optical, and acoustical interactions. *3 sem. hrs.*

**ELE 507. ELECTROMAGNETIC FIELDS I:** Fundamental concepts: introduction to waves; theorems of electromagnetics; plane wave function; cylindrical wave functions. Applications to extremely low frequency through optical frequency systems. Prerequisite: ELE 442. *3 sem. hrs.*

**ELE 508. ELECTROMAGNETIC FIELDS II:** Spherical wave functions; perturbational and variational techniques; radiative systems; microwave networks. Prerequisite: ELE 442. *3 sem. hrs.*

**ELE 509. ANALYSIS OF LINEAR SYSTEMS:** A study of Fourier series, finite trigonometric series, Fourier transforms, and their applications in the analysis of linear systems. *3 sem. hrs.*

**ELE 511. ANTENNAS AND RADIATION THEORY:** Fundamental principles of antennas; analysis and synthesis of arrays; resonant antennas; frequency independent antennas; aperture and reflector antennas; applications to radar and communication systems. Prerequisite: ELE 442. *3 sem. hrs.*

**ELE 513. COMMUNICATION THEORY:** The application of fourier techniques to the analysis of communication problems; theory of random signals, autocorrelation, power density spectra, and optimum filters, and spread spectrum. Prerequisites: ELE 413, 517. *3 sem. hrs.*

**ELE 514. ANALYSIS OF NONLINEAR SYSTEMS:** An advanced study of methods of analysis on nonlinear systems with application in the fields of electric circuit theory and control systems. Prerequisite: ELE 509. *3 sem. hrs.*

**ELE 515. AUTOMATIC CONTROL THEORY:** Analysis and synthesis of feedback control systems; graphical frequency-response techniques; establishing performance criteria; state-space techniques. Prerequisite: ELE 432. 3 sem. hrs.

**ELE 517. RANDOM PROCESSES IN SYSTEM THEORY I:** An introduction to the theory of probability and random processes as applied to system theory. The axioms of probability; the concept of random variable, density, distributions; functions of random variables; correlation functions, spectral density functions, and their use in linear system theory. Prerequisites: ELE 331 or consent of instructor. 3 sem. hrs.

**ELE 522. MAGNETIC MEASUREMENTS AND INSTRUMENTS:** Magnetic material properties; quantities and units. Field generation; measurement of field strength, magnetic moment and induction. A.C. permeability, iron losses, waveforms. Permanent magnet properties. Static and dynamic hysteresis loops. Magnetic domain observation. Thermomagnetic analysis. Prerequisite: ELE 524/MAT 512 or consent of instructor. 3 sem. hrs.

**ELE 523. PERMANENT MAGNETS:** Basic properties and description. Magnetic circuit design. Magnet materials types and properties. Physics and metallurgy of permanent magnets. Property measurement. Engineering applications. Present research activities. Three weekly lecture hours and five laboratory sessions of 4 hours each. Field trip to magnet manufacturer, if possible. Prerequisite: ELE 524/MAT 512 or consent of instructor. 3 sem. hrs.

**ELE 524. MAGNETIC MATERIALS — PHYSICAL PRINCIPLES:** Description of magnetic material properties. The magnetic circuit. Atomic magnetism. Types of magnetic order and spin structures. Intrinsic magnetization. Molecular field concept. Domains. Prerequisite: ELE 333 or consent of instructor. 3 sem. hrs.

**ELE 525. MAGNETIC MATERIALS FOR ENGINEERING APPLICATIONS:** Magnetic anisotropies. Magnetostriction and stress effects. Domains, walls and magnetization processes. Origins of coercivity and hysteresis loss. Nature, properties and uses of commercial materials, soft and hard magnetic, crystalline and amorphous. Survey of applications. Prerequisite: ELE 524/MAT 512 or consent of instructor. 3 sem. hrs.

**ELE 525S. MAGNETIC MATERIALS PROSEMINAR:** Library research on one magnetism topic, formal written and oral report required. Attend seminars of other students and visiting scholars. Corequisite: ELE 525/MAT 513. 1 sem. hr.

**ELE 526. APPLIED SUPERCONDUCTIVITY:** Basic phenomena. Theoretical concepts. Superconducting materials—types, properties, physics, metallurgy. Superconducting magnets. Other current and future engineering applications. (Consent of instructor.) 3 sem. hrs.

**ELE 527. RANDOM PROCESSES IN SYSTEM THEORY II:** A continuation of ELE 517, Random Processes in System Theory I, with emphasis on current topics such as Wiener and Kalman Filtering. Prerequisite: ELE 517. 3 sem. hrs.

**ELE 533. COMPUTER DESIGN:** Register Transfer Operations: Multi-input System controller design; Hardware Implementation of Arithmetic Processors and ALU; Instruction Format; Microprogramming; Hardwired and Microprogrammed Control; Program-controlled and Channel-oriented Input-Output Organization: Asynchronous Receiver-Transmitters, DMA, Handshaking and Interrupt. Comparative architectures. Prerequisite: ELE 501. 3 sem. hrs.

ELE 535. CODING THEORY: The theory of error-correcting, error-detecting codes as applied to the design of reliable digital data systems. Prerequisite: ELE 501.

3 sem. hrs.

ELE 536. MICROPROCESSOR APPLICATIONS: Project studies, applications of microprocessors in practical implementations. Logic implementation using software, memory mapped I/O problems and interrupt structure implementation. Use of assembler and/or cross assemblers. Study of alternate microprocessor families including industrial controllers using STD bus systems. Prerequisite: ELE 533.

3 sem. hrs.

ELE 541. POWER ELECTRONICS: Applications of power semiconductors to power control amplification, and regulation, in the light of an integrated, quantitative treatment of mechanical, thermal, and electrical characteristics and ratings; modeling for linear, nonlinear and switching modes; and thermal and electric circuit interactions. Prerequisite: ELE 313 or equivalent.

3 sem. hrs.

ELE 551. ELECTRICAL POWER SYSTEMS DYNAMICS: Basic structure of the electrical power transmission system; criteria for system stability; symmetrical components; synchronous machine equations of motion, transients and dynamics; transmission line surges, short circuit calculations. Prerequisites: ELE 333, 431.

3 sem. hrs.

ELE 555. SYSTEMS DYNAMICS I: The methodology for modeling the dynamics of complex social-economic systems. Use of these models to study organizational policies and design for higher order multiple-loop, nonlinear feedback structures.

3 sem. hrs.

ELE 561. DIGITAL SIGNAL PROCESSING I: A study of one-dimensional digital signal processing, including a review of continuous-system analysis and sampling. Topics include z-transform techniques, digital filter, and Fast Fourier Transform processing techniques.

3 sem. hrs.

ELE 562. DIGITAL SIGNAL PROCESSING II: A study of the architectural requirements for processors which perform one-dimensional digital signal processing. This will include the techniques for the design of both hardware and software elements needed for implementation of digital signal processors as well as discussions of application of these processors. Prerequisite: ELE 561.

3 sem. hrs.

ELE 571. IMAGE PROCESSING: An introduction to image processing, including the human visual system, image formats, two-dimensional transforms, histograms, image restoration and image reconstruction. Both digital and analog techniques are demonstrated.

3 sem. hrs.

ELE 572. FOURIER OPTICS: Fourier transformation and imaging properties of lenses; diffraction of aberrations; frequency analysis of optical imaging systems; spatial filtering and optical information processing; holography. Prerequisites: ELE 333 or equivalent.

3 sem. hrs.

ELE 573. ELECTRO-OPTICAL DEVICES AND SYSTEMS: A study of electro-optical (E-O) components including sources, modulators, switches, detectors, etc., and their application in E-O systems of various types. The theory and design of E-O systems emphasizing areas such as display technology, surveillance systems and components, and other disciplines in which electronic and optical elements are arranged to interact synergistically will be treated.

3 sem. hrs.



ELE 577L. ELECTRO-OPTICAL LABORATORY III: Experimentation with E-O systems emphasizing areas such as display technology, surveillance systems and components, and other disciplines in which electronic and optical elements are arranged to interact synergistically. *1 sem. hrs.*

ELE 595. SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING: Particular assignments to be arranged and approved by the chairperson of the department. *2-6 sem. hrs.*

ELE 599. THESIS *3-6 sem. hrs.*

ELE 601. FINITE AUTOMATA THEORY: Advanced Sequential Machine Theory: Finite-state machines, regular expressions, linear machines, sequential iterative systems, fault detection and diagnosis, applications. Prerequisite: ELE 501. *3 sem. hrs.*

ELE 603. MAGNETIC ANISOTROPY AND MAGNETOSTRICTION: Mathematical description of magnetic anisotropy and magneto-elastic phenomena. Physical causes of magneto-crystalline anisotropy and magnetostriction. Relationship of theory of magnetic exchange. Prerequisite: ELE 525 or consent of instructor. *3 sem. hrs.*

ELE 626. SYSTEM DYNAMICS II: The continuation of Systems Dynamics I with special emphasis on the study of large scale corporate, urban, educational, and ecological systems. Prerequisite: ELE 555. *3 sem. hrs.*

ELE 636. ADVANCED COMPUTER ARCHITECTURES: Comparative evaluation of advanced and experimental computer structures. Investigation of optical, multiprocessor, array, various hybrid and neural network type architectures. Prerequisite: ELE 536. *3 sem. hrs.*

ELE 690. SELECTED READINGS IN ELECTRICAL ENGINEERING: Directed readings in electrical engineering areas to be arranged and approved by the chairperson of the student's advisory committee and the department chairperson. May be taken more than once. *1-3 sem. hrs.*

ELE 695. SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING: Special electrical engineering topics not covered in regular courses. Course sections arranged and approved by chairperson of the student's advisory committee and the department chairperson. May be taken more than once. *1-3 sem. hrs.*

ELE 698. D.E. DISSERTATION: An original investigation as applied to engineering practice. Results must be of sufficient importance to merit publication. *1-15 sem. hrs.*

ELE 699. Ph.D. DISSERTATION: An original research effort in electrical engineering which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication. *1-15 sem. hrs.*

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## ELECTRO-OPTICS (EOP)

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Donald L. Moon, Director of the Program

The program of study for the Master of Science in Electro-Optics is an interdisciplinary program administered by the School of Engineering with the cooperative support of the College of Arts and Sciences.

### PROGRAM REQUIREMENTS

To be considered for admission to graduate study in electro-optics a student must have received an undergraduate degree with emphasis in engineering, physics, optics, chemistry, or applied mathematics. Students who have degrees in chemistry or applied mathematics, or related sciences are encouraged to apply, but they may be required to take a limited amount of undergraduate work to complete their preparation for graduate study in electro-optics. Students are expected to have some competency in computer programming and modern electronics.

The program of study in electro-optics must include a minimum of 30 semester hours consisting of the following:

1. Twenty-one semester hours of core courses in Electro-Optics: EOP 501, EOP 502, EOP 503, EOP 504, EOP 505, EOP 506, EOP 541L, EOP 542L, EOP 543L.
2. Six semester hours of thesis work and three semester hours of a technical elective in the case of a thesis option. Most students will be required to do a thesis.
3. Nine semester hours of approved technical electives in the case of a non-thesis option.
4. Students taking the non-thesis option will take a comprehensive written examination just prior to their anticipated graduation date. The examination will be administered by a three-person committee which will report to the program director those students who have passed the examination and recommend them for graduation. The examination may be repeated once, but not in the same academic term.

See also the Master's Degree Regulations in the introductory section of this chapter, and consult with the director of the Master of Science in the Electro-Optics program.

### COURSES OF INSTRUCTION

EOP 501. GEOMETRIC OPTICS: Wavefronts and rays; Fermat's principle; Gaussian optics of axially symmetrical systems; aperture stops; pupils and field lenses; Lagrange invariant; angular and visual magnification; optical systems; plane mirrors and prisms; aberration theory; introduction to computer ray tracing. Prerequisites: Acceptance into the graduate Electro-Optics program or permission of the program director.

*3 sem. hrs.*

**EOP 502. OPTICAL RADIATION AND MATTER:** Maxwell's equations; electromagnetic waves; interaction of radiation with atomic electrons; molecular and lattice vibration; study of phenomena related to the interaction of optical radiation with matter; polarization; crystal optics; nonlinear dielectric effects. Prerequisites: acceptance into the graduate Electro-Optics program or permission of the program director.

*3 sem. hrs.*

**EOP 503. LINEAR SYSTEMS THEORY IN OPTICS:** Wave theory; electromagnetic theory; mathematical techniques; Fresnel and Fraunhofer diffraction; coherence; and interference. Prerequisites: acceptance into the graduate Electro-Optics program or permission of the program director.

*3 sem. hrs.*

**EOP 504. FOURIER OPTICS:** Fourier transformation and imaging properties of lenses; diffraction of aberrations; frequency analysis of optical imaging systems; spatial filtering and optical information processing; holography. Prerequisites: EOP 503, or by permission of the program director.

*3 sem. hrs.*

**EOP 505. INTRODUCTION TO LASERS:** Laser theory; coherence; Gaussian beams; optical resonators; properties of atomic and molecular radiation; laser oscillation and amplification; methods of excitation of lasers; characteristics of common lasers; laser applications. Prerequisites: EOP 502 or a working knowledge of Maxwell's Equations, and physical optics, or permission of the course instructor or program director.

*3 sem. hrs.*

**EOP 506. ELECTRO-OPTICAL DEVICES AND SYSTEMS:** Sources; modulators; switches, detectors; display technology; surveillance systems; electro-optical component applications in electro-optical systems; theory and design of electro-optical systems. Prerequisites: EOP 502 or permission of the program director.

*3 sem. hrs.*

**EOP 521. STATISTICAL OPTICS:** Optical phenomena and techniques requiring statistical methods for practical understanding and application; relevant statistical techniques for the analysis of image processing systems and the design of laser radar systems; engineering applications of statistical techniques. Prerequisites: completion of the core courses of the graduate Electro-Optics program or by permission of the program director.

*3 sem. hrs.*

**EOP 522. TECHNIQUES OF OPTICAL PROCESSING:** Techniques and applications of optical image and signal processing; coherent optics; matched filters; computer generated holograms; spatial light modulators; incoherent optical processing; modulators for signal processing. Prerequisites: completion of the core courses of the graduate Electro-Optics program or permission of the program director.

*3 sem. hrs.*

**EOP 523. TOPICS IN MODERN OPTICS:** Theory and applications of dielectric coatings; theory and applications of metallic coatings; properties and applications of optical materials; characterization of optical surfaces; and theory and measurement of optical surface scattering.

*3 sem. hrs.*

**EOP 524. OPTICAL COMPUTING SYSTEMS:** Computation architectures; number systems; residue arithmetic; optical logic units; multi-purpose arithmetic modules; communication busses; encoding, decoding and scaling; processor design methods. Prerequisites: EOP 503, EOP 504, and completion of a course in computer systems or permission of the program director.

*3 sem. hrs.*

**EOP 525. LASER PROBE TECHNIQUES:** Applications of optical phenomena and lasers to noninvasive measurements; absorption and emission spectroscopies; laser-induced fluorescence spectroscopy; high-sensitivity detection methods using lasers; spontaneous and coherent Raman spectroscopies; Rayleigh and Mie scattering techniques; laser Doppler techniques; gas flow and combustion diagnostics and other applications of laser spectroscopy and light scattering. Prerequisites: completion of the core courses of the graduate Electro-Optics program or permission of the program director.

*3 sem. hrs.*

**EOP 541L. ELECTRO-OPTICS LABORATORY I:** Geometrical optics; characterization of optical elements; diffraction, interference; detectors; spectroscopy. Prerequisites: EOP 501 or a previous optics course, or permission of the course instructor or program director.

*1 sem. hrs.*

**EOP 542L. ELECTRO-OPTICS LABORATORY II:** Electro-Optical systems; display technology; electro-optical system components; optical detection; detectors; image processing. Prerequisites: EOP 506 or permission of the course instructor or program director.

*1 sem. hrs.*

**EOP 543L. ELECTRO-OPTICS LABORATORY III:** Laser characterization; properties of laser light; optical signal processing; holography; laser modulation; fiber optics. Prerequisites: EOP 541L or permission of the course instructor or program director.

*1 sem. hrs.*

**EOP 595. SPECIAL PROBLEMS IN ELECTRO-OPTICS:** Particular assignments to be arranged and approved by the director of the program.

*2-6 sem. hrs.*

**EOP 599. THESIS**

*3-6 sem. hrs.*

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## ENGINEERING (EGR)

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Gary A. Thiele, Director of the Program and  
Associate Dean of Engineering

The Master of Science in Engineering allows flexibility for general or specialized program construction according to the needs of the individual student in conformance with the requirements of the School of Engineering and the University of Dayton. The program of study leading to the Master of Science in Engineering must include a minimum of 33 semester hours of the following:

1. Fifteen semester hours in a major area.
2. Fifteen semester hours of electives.
3. Three semester hours of research on an approved project.

See also Master's Degree Regulations in the introductory section of this chapter, and consult with the director of the Master of Engineering program.

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# ENGINEERING MANAGEMENT (ENM)

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John R. Fraker, Director of the Program

## PROGRAM REQUIREMENTS

The program of study leading to the Master of Science in Engineering Management is designed to prepare the practicing engineer for the management of engineering activities in any environment — in industry, in government, in business, in the military. It must include a minimum of 36 semester hours consisting of the following:

1. Eighteen semester hours of core courses in Engineering Management. These are ENM 505, ENM 530, ENM 535, ENM 582 or MBA 587, ENM 585, and ENM 590.
2. Nine semester hours of engineering electives. This requirement will normally be satisfied by nine semester hours of courses in the student's own field of engineering.
3. Nine hours of electives as approved by the advisor and the program director.

See also Master's Degree Regulations in the introductory section of this chapter and consult with the advisor.

## COURSES OF INSTRUCTION

ENM 505. MANAGEMENT OF ENGINEERING SYSTEMS: Introduction to the functions and tools of engineering management; the specific roles and relationships of engineering activities in the total enterprise; the techniques of systems analysis, engineering system design, and system optimization. *3 sem. hrs.*

ENM 506. ENGINEERING MANAGEMENT AND SOCIETY: Important governmental and societal dimensions affecting engineering systems. *3 sem. hrs.*

ENM 510. TECHNOLOGICAL FORECASTING: State-of-the-art techniques for technological forecasting in R & D and other related areas. Topics presented include the Delphi Method, techniques of technological forecasting, growth curves, and various relevant mathematical models. Areas of application are tailored to student interests. *3 sem. hrs.*

ENM 511. TECHNOLOGY ASSESSMENT: Examination of the impacts of technological change on society. Review of the impacts of several major technological changes of the past, including both anticipated and unanticipated changes. Methods for assessing and predicting the consequences of technological change. *3 sem. hrs.*

ENM 515. HUMAN FACTORS ENGINEERING: Introduction to the human factors criteria that should be considered in the design of man-machine systems, work situations, and man's physical environment. *3 sem. hrs.*

ENM 521. OPERATIONS RESEARCH I: Introduction to the deterministic models and methods of operations research, with emphasis on the solution of real problems in both the public and private sectors. Topics from mathematical programming, network analysis, and game theory. The use of the digital computer is emphasized. *3 sem. hrs.*

ENM 522. OPERATIONS RESEARCH II: Introduction to the probabilistic models and methods of operations research, with emphasis on the solution of real problems in both the public and private sectors. Topics include inventory models, stochastic processes, queueing theory, and system simulation. The use of the digital computer is emphasized. Prerequisite: MTH 367 or equivalent. 3 sem. hrs.

ENM 523. OPTIMIZATION I: Introduction to the methodology of optimization with emphasis on application to engineering systems. Classical optimization, constrained optima, search techniques, steepest ascent techniques. The use of the digital computer is emphasized. 3 sem. hrs.

ENM 530. COST AND ECONOMIC ANALYSIS FOR ENGINEERS: Principles and methods of economic analysis of engineering activities. The time value of money, short-term and long-term investments, comparison of alternatives, replacement analysis, and minimum cost models. 3 sem. hrs.

ENM 535. INTRODUCTION TO DECISION MAKING: Introduction to rational decision making with applications in the analysis and design of engineering and management systems. Decision making under uncertainty and risk as well as under certainty. Group decision making. Multiple-criteria decision making. Prerequisite: MTH 368 or equivalent. 3 sem. hrs.

ENM 541. PRODUCTION ENGINEERING: The design of systems of men and machine for the production process: forecasting, scheduling, production and inventory control, staffing, and equipment replacement. Prerequisite: MTH 368 or equivalent. 3 sem. hrs.

ENM 551. POLICY ANALYSIS AND PLANNING IN PUBLIC SYSTEMS I: General introduction to qualitative and quantitative methodologies of policy analysis and planning in the public sector with special emphasis on project and program planning. 3 sem. hrs.

ENM 552. POLICY ANALYSIS AND PLANNING IN PUBLIC SYSTEMS II: Continuation of ENM 551 with emphasis on complete analysis of large scale public systems. Prerequisite: ENM 551 or equivalent. 3 sem. hrs.

ENM 553. PUBLIC SYSTEMS ENGINEERING: Guided study of the application of policy analysis and planning techniques for public systems. Emphasis on urban-regional improvement and world systems of energy and food. Prerequisite: ENM 551 or equivalent. 3 sem. hrs.

ENM 555. SYSTEM DYNAMICS I: Introduction to the methodology for modeling the dynamics of complex engineering, business, and socioeconomic systems. The use of these models to study the effect of organizational policies and design in higher order, multiple-loop, nonlinear feedback systems. The use of the digital computer is emphasized. 3 sem. hrs.

ENM 556. SYSTEMS DYNAMICS II: Continuation of ENM 555 with emphasis on the study of large scale corporate, urban, educational, and ecological systems. Prerequisite: ENM 555 or equivalent. 3 sem. hrs.

ENM 560. QUALITY ASSURANCE: Application of statistical principles of analysis and control to production processes, studies of process capabilities, quality control, and engineering experimentation. Prerequisite: MTH 368 or equivalent. 3 sem. hrs.

**ENM 561. DESIGN AND ANALYSIS OF EXPERIMENTS:** Advanced topics in experimental design and analysis, including experimental design, response surface analysis, multiple and partial regression and correlation. The use of the digital computer is emphasized. Prerequisite: MTH 368 or equivalent. 3 sem. hrs.

**ENM 565. RELIABILITY ENGINEERING I:** Introduction to the concepts and methodology of reliability engineering. The reliability of components and multi-component systems, analysis and design of systems, and design and evaluation of processes for assuring the reliability, maintainability, and availability of systems. Prerequisite: MTH 368 or equivalent. 3 sem. hrs.

**ENM 566. RELIABILITY ENGINEERING II:** Continuation of ENM 565. Advanced topics in reliability engineering, with emphasis on the design of systems to meet specified reliability, availability, and maintainability requirements. Prerequisite: ENM 565 or equivalent. 3 sem. hrs.

**ENM 572. SYSTEM SIMULATION:** The construction of models which simulate real systems, the generation of random inputs to obtain sample observations of the model, and the inference of system properties from the observations of the model. Experimental design and variance-reduction techniques. The use of the digital computer is emphasized. Prerequisite: MTH 368, ENM 522 or equivalent. 3 sem. hrs.

**ENM 575. INTRODUCTION TO ARTIFICIAL INTELLIGENCE:** Introduction to the principles, concepts, and areas of research in artificial intelligence and their application to engineering design and analysis. Emphasis on knowledge representation and processing. Survey of applications in expert systems, natural language processing, computer vision, and robotics. 3 sem. hrs.

**ENM 577. INTRODUCTION TO EXPERT SYSTEMS:** Introduction to the development and application of expert systems. Computer-based methods for knowledge representation and reasoning, methods for knowledge acquisition from domain experts, and expert system building tools. Emphasis on problem assessment, software requirements, implementation, evaluation, and maintenance. 3 sem. hrs.

**ENM 579. SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE:** Special topics in artificial intelligence of relevance to the student of engineering management. Arranged and approved by the advisor and the program director. 1-3 sem. hrs.

**ENM 582. ORGANIZATIONAL DEVELOPMENT IN AN ENGINEERING ENVIRONMENT:** The inter-personal and group skills needed by the engineering manager. Emphasis on establishing work environments which allow for communication, trust, high morale, satisfaction, and productive group activity. 3 sem. hrs.

**ENM 585. ORGANIZATIONAL SYSTEMS:** Introduction to organizational theory and practice with emphasis on the design of organizational structures for the effective integration of production, research and development, and engineering activities. Special topics include high performing systems, the technical *ad hoc* committee, matrix organization, and project management. 3 sem. hrs.

**ENM 586. DESIGN OF ORGANIZATIONAL SYSTEMS:** Guided study of the design of organizations. Emphasis on the implementation of actual design studies. Prerequisite: ENM 585. 3 sem. hrs.

**ENM 590. CASE STUDIES IN ENGINEERING MANAGEMENT:** Student participation in an engineering management project or study under the direction of a project advisor. A satisfactory written engineering report, as determined by the project advisor, is required at the completion of the project. Prerequisite: permission of the advisor.

*3-6 sem. hrs.*

**ENM 595. SPECIAL PROBLEMS IN ENGINEERING MANAGEMENT:** Special assignments in engineering management to be arranged and approved by the advisor and the program director.

*2-6 sem. hrs.*

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## MANAGEMENT SCIENCE (MSC)

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John R. Fraker, Director of the Program

### PROGRAM REQUIREMENTS

The program leading to the Master of Science in Management Science is interdisciplinary and is administered by the School of Engineering with the cooperative support of the College of Arts and Sciences, the School of Business Administration, and the School of Education. Applications are invited from college graduates in all fields of study — business, education, engineering, the liberal arts, the physical sciences, and the social sciences. The applicant whose preparation does not include at least three semesters of analytic geometry and calculus, two semesters of probability and statistics, and competence in a computer language will be expected to satisfactorily complete appropriate prerequisite courses prior to admission to the program.

The management scientist is the manager or staff specialist who is trained in the quantitative methodologies of operations research, systems analysis, and the decision sciences. The student is proficient in problem solving and decision making, system modeling and optimization, and the application of probability and statistical theory to management problems and must be familiar with a variety of other topics, such as quality control, inventory planning and control, reliability and maintainability, and system simulation.

The objective of this program is to develop quantitative management skills and capabilities appropriate to each student's needs and objectives. The program emphasizes the practical application of the techniques of management science in our modern society, and the importance of the computer as a tool for the management scientist is stressed throughout the program. The program of study must include a minimum of 36 semester hours consisting of the following:

1. Eighteen semester hours of courses in Management Science. These will normally include MSC 521, 522, and 535.
2. Nine semester hours in a cognate field appropriate to the student's objectives, as approved by the advisor. Approved fields of study for the cognate field are applied mathematics, business administration,



computer science, educational administration, engineering, human factors, public administration, and artificial intelligence.

3. Nine semester hours of electives as approved by the advisor and the program director.

See also Master's Degree Regulations in the introductory section of this chapter and consult with the advisor.

## COURSES OF INSTRUCTION

**MSC 521. OPERATIONS RESEARCH I:** Introduction to the deterministic models and methods of operations research, with emphasis on the solution of real problems in both the public and private sectors. Topics from mathematical programming, network analysis, and game theory. The use of the digital computer is emphasized. *3 sem. hrs.*

**MSC 522. OPERATIONS RESEARCH II:** Introduction to the probabilistic models and methods of operations research, with emphasis on the solution of real problems in both the public and private sectors. Topics include inventory models, stochastic processes, queueing theory, and system simulation. The use of the digital computer is emphasized. *3 sem. hrs.*  
Prerequisite: MTH 367 or equivalent.

**MSC 523. OPTIMIZATION I:** Introduction to the methodology of optimization with emphasis on application to engineering systems. Classical optimization, constrained optima, search techniques, and steepest ascent techniques. The use of the digital computer is emphasized. *3 sem. hrs.*

**MSC 526. OPTIMIZATION II:** Advanced topics in linear programming. Emphasis on computational techniques and applications of linear programming to industrial problems. Primal-dual algorithm, decomposition principle, assignment problem, transportation and trans-shipment problems, network flow algorithms, and integer programming. The use of the digital computer is emphasized. Prerequisite: MSC 521. *3 sem. hrs.*

**MSC 527. OPTIMIZATION III:** Nonlinear and dynamic programming. Development of the theory and computational techniques of nonlinear and dynamic programming. Applications of optimization methods, nonlinear programming, stochastic programming, gradient methods, dynamic programming, Kuhn-Tucker theory, and quadratic programming. The use of the digital computer is emphasized. Prerequisites: MSC 521 and 523. *3 sem. hrs.*

**MSC 535. INTRODUCTION TO DECISION MAKING:** Introduction to rational decision making with applications in the analysis and design of engineering and management systems. Decision making under uncertainty and risk as well as under certainty. Group decision making. Multiple-criteria decision making. Corequisite: MTH 368 or equivalent. *3 sem. hrs.*

**MSC 541. PRODUCTION ENGINEERING:** The design of systems of men and machines for the production process: forecasting, scheduling, production and inventory control, staffing, and equipment replacement. Prerequisite: MTH 368 or equivalent. *3 sem. hrs.*

**MSC 542. INVENTORY THEORY AND APPLICATION:** Theory and application of inventory control with respect to costs of ordering and manufacturing, holding and storage, shortage penalty costs, revenues, and discount rates. Forecasting material control, input capacity and scheduling, stochastic inventory models, and dynamic inventory models including real time computerized inventory control models. Prerequisites: MTH 368, MSC 522 or equivalent. *3 sem. hrs.*

**MSC 544. DISCRETE TIME SERIES:** Emphasis on industrial application of open loop statistical forecasts. Techniques of describing a time series by very general classes of functions, including trigonometric functions. Prerequisites: MTH 368, MSC 522 or equivalent. *3 sem. hrs.*

**MSC 546. QUEUEING THEORY AND APPLICATION:** Emphasis on application of queueing theory to engineering problems. Machine interference, mathematical queueing models, marketing models, servicing problems, Monte Carlo techniques, and computer simulation models. Prerequisites: MTH 368, MSC 522 or equivalent. *3 sem. hrs.*

**MSC 555. SYSTEM DYNAMICS I:** Introduction to the methodology for modeling the dynamics of complex engineering, business, socioeconomic systems. The use of these models to study the effect of organizational policies and design in higher order, multiple-loop, nonlinear feedback systems. The use of the digital computer is emphasized. *3 sem. hrs.*

**MSC 556. SYSTEM DYNAMICS II:** Continuation of MSC 555 with emphasis on the study of large scale corporate, urban, educational, and ecological systems. Prerequisite: MSC 555 or equivalent. *3 sem. hrs.*

**MSC 560. QUALITY ASSURANCE:** Application of statistical principles of analysis and control to production processes, studies of process capabilities, quality control, and engineering experimentation. Prerequisite: MTH 368 or equivalent. *3 sem. hrs.*

**MSC 561. DESIGN AND ANALYSIS OF EXPERIMENTS:** Advanced topics in experimental design and analysis, including experimental design, response surface analysis, multiple and partial regression and correlation. The use of the digital computer is emphasized. Prerequisite: MTH 368 or equivalent. *3 sem. hrs.*

**MSC 565. RELIABILITY ENGINEERING I:** Introduction to the concepts and methodology of reliability engineering. The reliability of components and multi-component systems, analysis and design of systems, and design and evaluation of processes for assuring the reliability, maintainability, availability of systems. Prerequisite: MSC 368 or equivalent. *3 sem. hrs.*

**MSC 566. RELIABILITY ENGINEERING II:** Continuation of MSC 565. Advanced topics in reliability engineering, with emphasis on the design of systems to meet specified reliability, availability, and maintainability requirements. Prerequisite: MSC 565 or equivalent. *3 sem. hrs.*

**MSC 572. SYSTEM SIMULATION:** The construction of models which simulate real systems, the generation of random inputs to obtain sample observations of the model, and the inference of system properties from the observations of the model. The use of the digital computer is emphasized. Prerequisites: MTH 368, MSC 522 or equivalent. *3 sem. hrs.*

**MSC 575. INTRODUCTION TO ARTIFICIAL INTELLIGENCE:** Introduction to the principles, concepts, and areas of research in artificial intelligence and their application to engineering design and analysis. Emphasis on knowledge representation and processing. Survey of applications in expert systems, natural language processing, computer vision, and robotics. *3 sem. hrs.*

**MSC 577. INTRODUCTION TO EXPERT SYSTEMS:** Introduction to the development and application of expert systems. Computer-based methods for knowledge representation and reasoning, methods for knowledge acquisition from domain experts, and expert system building tools. Emphasis on problem assessment, software requirements, implementation, evaluation and maintenance. *3 sem. hrs.*

**MSC 579. SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE:** Special topics in artificial intelligence of relevance to the student of management science. Arranged and approved by the advisor and the program director. May be repeated. *1-3 sem. hrs.*

**MSC 595. CURRENT PROBLEMS:** (Subject will vary.) Topics of current interest in specialized areas of Management Science. *3 sem. hrs.*

**MSC 599. THESIS** *6 sem. hrs.*

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## **MATERIALS ENGINEERING (MAT)**

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James A. Snide, Director of the Program

Materials Engineering is a major concentration for both the Doctor of Philosophy in Engineering and the Doctor of Engineering. See Doctor's Degree Regulations in the introductory section of this chapter and consult with the director of the programs.

### **PROGRAM REQUIREMENTS**

The program of study leading to the Master of Science in Materials Engineering must include a minimum of 30 semester hours consisting of the following:

1. Twelve semester hours in the major field.
2. Twelve semester hours of approved electives from current course offerings which best suit the student's requirements.
3. Six semester hours of research on a Materials Engineering project or thesis.

Upon the request of the student and with the approval of the advisor and the program director, this may be replaced by nine semester hours of additional course work.

See also Master's Degree Regulations in the introductory section of this chapter, and consult with the advisor.

## COURSES OF INSTRUCTION

**MAT 501. PRINCIPLES OF MATERIALS I:** The electronic, atomic, submicroscopic, microscopic, and macroscopic structures of crystalline solids, including bonding, electron theory of metals, crystals, dislocations, phase diagrams, phase transformations, and diffusion. Prerequisite: MTH 219. *3 sem. hrs.*

**MAT 502. PRINCIPLES OF MATERIALS II:** A general introduction to the mechanical and electronic properties of materials. Elasticity; plasticity creep; fracture; electrical and thermal processes; magnetic, dielectric and optical properties. Prerequisite: MAT 501. *3 sem. hrs.*

**MAT 503. X-RAY CRYSTALLOGRAPHY:** Introduction to the fundamentals of crystallography and x-ray diffraction techniques with application to the study of materials. Two hours lecture and one three-hour laboratory per week. Prerequisite: MAT 501 or consent of instructor. *3 sem. hrs.*

**MAT 504. TECHNIQUES IN MATERIALS ANALYSIS:** Fundamentals and applications of the traditional analytical methods such as metallography, x-ray analysis, electron microprobe, transmission and scanning microscopy. Recent techniques: NMR, EPR, atomic absorption, Raman and Mossbauer spectroscopy, holography, ESCA and Auger spectroscopy. Emphasis on applicability. Prerequisite: MAT 501 or consent of instructor. *3 sem. hrs.*

**MAT 505. THERMODYNAMICS OF SOLIDS:** Thermodynamic properties of solutions and intermediate phases. Equilibrium behavior of phase mixtures. Representation of multi-component phase diagram. Experimental Determination and prediction of phase diagrams. Prerequisite: MAT 502 or consent of instructor. *3 sem. hrs.*

**MAT 506. MECHANICAL BEHAVIOR OF MATERIALS:** Description of the state of stress and strain in materials, plastic deformation, fatigue, fracture, creep, and rupture. Prerequisite: MAT 502 or consent of instructor. *3 sem. hrs.*

**MAT 507. INTRODUCTION TO CERAMIC MATERIALS:** Ceramic raw materials, manufacturing processes, and unique properties of ceramic products: glasses, porcelain enamels, ceramic-metal seals, electrical and magnetic ceramics, refractories, and ceramics for special applications. Prerequisite: MAT 501. *3 sem. hrs.*

**MAT 508. PRINCIPLES OF MATERIAL SELECTION:** Basic scientific and practical consideration involved in the intelligent selection of materials for specific applications. Impact of new developments in materials technology and analytical techniques. Prerequisite: MAT 501 or consent of instructor. *3 sem. hrs.*

**MAT 509. INTRODUCTION TO POLYMER SCIENCE:** Introduction to polymers. A review of the field, including polymer production, characterization, and processing. Prerequisite: college Chemistry and calculus. *3 sem. hrs.*

**MAT 510. PHYSICAL PROPERTIES OF POLYMERS:** Intensive discussion of the interrelations between molecular structure and gross physical properties of polymers. Emphasis on relating laboratory data to industrial applications. Prerequisites: Background in differential equations, organic or physical chemistry or MAT 509. *3 sem. hrs.*

**MAT 511. PRINCIPLES OF CORROSION:** Application of electrochemical principles, corrosion reactions, passivation, cathodic and anodic protection, stress corrosion, and high temperature oxidation. *3 sem. hrs.*

**MAT 512. MAGNETIC MATERIALS — PHYSICAL PRINCIPLES:** Description of magnetic material properties. The magnetic circuit. Atomic magnetism. Types of magnetic order and spin structure. Intrinsic magnetization. Molecular field concept. Anisotropy. Magnetostriction. Magnetic resonances. Prerequisite: ELE 333 or consent of instructor.  
3 sem. hrs.

**MAT 513. MAGNETIC MATERIALS FOR ENGINEERING APPLICATIONS:** Magnetic domains. Technical magnetization and domain structure. A.C. properties, losses, eddy currents. Causes of coercivity. Metallic and ceramic materials for transformers, electrical machinery, permanent magnets, HF devices, data recording, computer memories. Metallurgy and crystallography of magnetic materials. Prerequisite: MAT 512 or consent of instructor. Note: Simultaneous attendance in MAT 513S is recommended. 3 sem. hrs.

**MAT 513S. MAGNETIC MATERIALS PROSEMINAR** 1 sem. hr.

**MAT 514. APPLIED SUPERCONDUCTIVITY - AN INTRODUCTION:** Basic phenomena. Theoretical concepts, Superconductive materials - types, properties, physics, metallurgy, Superconducting magnets. Other present and future engineering applications. Prerequisite: consent of instructor.  
2 sem. hrs.

**MAT 516. THEORY OF SOLIDIFICATION OF METALS:** Classical treatment of solid-liquid phase transformation applying theories of nucleation and growth, diffusion and heat transfer. Recent work in advanced solidification techniques will be reviewed. Prerequisite: MAT 502 or consent of instructor.  
3 sem. hrs.

**MAT 515. STATISTICAL THERMODYNAMICS:** Microscopic thermodynamics; kinetic theory; virial theorem of Clausius; transport phenomena; Gibbs, Boltzman, Bose-Einstein, Fermi-Dirac statistics. Connection between statistical and thermodynamic qualities. Applications to perfect and real gases, liquids, crystalline solids, and thermal radiation. Information theory, irreversible thermodynamics. Prerequisites: MEE 301, MTH 219.  
3 sem. hrs.

**MAT 517. PHASE DIAGRAMS:** Construction, interpretation and application of phase diagrams for multi-component systems. Prerequisite: MAT 502.  
3 sem. hrs.

**MAT 518. DIFFUSION IN SOLIDS:** Atomistic and phenomenological treatment of multicomponent diffusion in the solid state. Prerequisite: MAT 502.  
3 sem. hrs.

**MAT 519. PHASE TRANSFORMATION IN METALS:** Classical treatment of phase transformation, nucleation and growth, recovery and recrystallization and advanced processes in control microstructures and properties. Prerequisite: MAT 502.  
3 sem. hrs.

**MAT 520. POWDER METALLURGY:** Theoretical treatment of various steps in the production of a powder metallurgy component including powder production and subsequent processing. Prerequisite: MAT 502.  
3 sem. hrs.

**MAT 521. NONDESTRUCTIVE EVALUATION:** Theoretical treatment of flaw detection techniques for both metals and advanced composites and statistical analysis of probability of detection and quality assurance. Prerequisite: MAT 502.  
3 sem. hrs.

**MAT 525. DESIGN OF MACROMOLECULAR SYSTEMS:** Polymer preparation by chain polymerization and stepwise polymerization; copolymerization; stereospecific polymerizations; formation of network polymers; heterogeneous reaction systems; aging and stabilization. Prerequisite: CHM 314, MAT 510.  
3 sem. hrs.

**MAT 526. POLYMER ENGINEERING:** Rheology of polymer metals; fundamentals of polymer processing; design of processing operation and their relation to the physical and mechanical behavior of polymers in molten and solid states; control of polymer processing through proper material selection. Prerequisite: MEE 308, MEE 410, MAT 510. *3 sem. hrs.*

**MAT 527. METHODS OF POLYMER ANALYSIS:** Modern laboratory techniques used in preparation and characterization of polymers; experimental investigations of polymer structure-property relations; measurement of molecular weight averages and distributions, thermal and mechanical properties, viscoelastic properties; transition and crystallinity. Prerequisite: MAT 509, MAT 510. *3 sem. hrs.*

**MAT 530. INTRODUCTION TO ANALYTICAL ELECTRON MICROSCOPY:** The student is introduced to applications of analytical electron microscopy methods and principles, including image formation, selected area and convergent beam electron diffraction, elemental analysis by energy dispersive spectroscopy and bulk material and thin foils, and basics of crystallographic analysis. Prerequisite: permission of instructor. *3 sem. hrs.*

**MAT 535. HIGH TEMPERATURE MATERIALS:** This course will provide the student with the basic material behavior concepts which control the high temperature properties. A special emphasis will be given to creep behavior of metals. In addition, the properties and applications of high temperature alloys will be studied, especially of those alloys used in the aerospace industry. Prerequisites: MAT 502 or equivalent. *3 sem. hrs.*

**MAT 536. LIGHT METAL ALLOYS:** Extraction alloy design, microstructure, mechanical properties and metallurgy of the light metals and applications of the light metals aluminum, magnesium and titanium. Prerequisites: MAT 502 or equivalent. *3 sem. hrs.*

**MAT 542. ADVANCED COMPOSITES:** Materials and Processing. Comprehensive introduction to advanced fiber reinforced polymeric matrix composites. Constituent materials, processing will be emphasized with special emphasis placed on the role of the matrix in composite processing and mechanical behavior and laminate processing. Specific topics will include starting materials, material forms, processing, quality assurance and mechanical behavior. Prerequisites: MAT 502, MAT 509, or consent of instructor. *3 sem. hrs.*

**MAT 543. MECHANICS OF COMPOSITE MATERIALS:** Analytical models are developed for predicting the mechanical and thermal behavior of fiber reinforced composites as a function of constituent material properties. Both continuous and discontinuous fiber reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micromechanics, and lamination theory. *3 sem. hrs.*

**MAT 544. STRUCTURAL BEHAVIOR OF COMPOSITES:** Comprehensive treatment of laminated plates and cylindrical shells. Bending, buckling, and vibration analysis are considered. Various orders of theory and their range of parametric application are emphasized. Thermal stresses are also considered. Prerequisite: MAT 543 or consent of instructor. *3 sem. hrs.*

**MAT 550. MATERIALS ENGINEERING PROJECT:** Student participation in a materials engineering project under the direction of a project advisor. The student prepares a satisfactory written report, as determined by the project advisor, and presents an open seminar on the subject of the project. *1-6 sem. hrs.*

MAT 560. SHOCK WAVES IN SOLIDS: Characteristics of intense shock waves in solids. Response of materials to high strain rate and high pressure. Prerequisites: general knowledge of physics, thermodynamics, and types of materials. 3 sem. hrs.

MAT 562. PENETRATION MECHANICS: Penetration mechanics of projectiles in metals, composites and brittle materials. Velocities will be low speed to hypervelocity. Prerequisites: MAT 560 or permission of instructor. 3 sem. hrs.

MAT 570. FRACTURE MECHANICS: Application of principles of fracture mechanics to fatigue and fracture in engineering structures. Prerequisites: MAT 502 or consent of instructor.

MAT 575. FATIGUE AND FRACTURE OF METALS AND ALLOYS: Treatment of the effect of microstructures on the fatigue and fracture of engineering metals and alloys. Various analytical techniques in the failure analysis of structural components will be reviewed. Prerequisite: MAT 502, MAT 506 or consent of instructor. 3 sem. hrs.

MAT 576. FATIGUE AND FRACTURE II: This course will cover the areas of fatigue crack propagation and environmental effects of fracture at fatigue. Specific aspects of fatigue mechanisms and failure analysis will also be covered. Prerequisites: MAT 575 or equivalent. 3 sem. hrs.

MAT 577. INTRODUCTION TO EXPERT SYSTEMS: Fundamentals of Artificial Intelligence (AI) and Expert Systems. Develop understanding of AI techniques and skill in building expert systems through laboratory exercises. 3 sem. hrs.

MAT 578. APPLICATION OF EXPERT SYSTEMS: The application of Artificial Intelligence techniques in engineering systems. Develop understanding of qualitative approaches to solving engineering problems and skills in coupling qualitative techniques through course project. Prerequisites: MAT 533. 3 sem. hrs.

MAT 590. SELECTED READINGS IN MATERIALS ENGINEERING: Directed readings in selected areas of materials engineering arranged and approved by the student's advisor and the program director. 1-3 sem. hrs.

MAT 595. SPECIAL PROBLEMS IN MATERIALS ENGINEERING: Special assignments arranged by the materials engineering faculty. 1-3 sem. hrs.

MAT 599. THESIS 3-6 sem. hrs.

MAT 601. SURFACE CHEMISTRY OF SOLIDS: The nature of solid surfaces and their importance to chemical and physical reactions at solid-gas, solid-liquid, and solid-solid interfaces. Prerequisites: MAT 501 and 502 or consent of instructor. 3 sem. hrs.

MAT 690. SELECTED READINGS IN MATERIALS ENGINEERING: Directed readings in materials engineering area arranged and approved by the chairperson of the student's advisory committee and the program director. May be repeated. 1-3 sem. hrs.

MAT 695. SPECIAL PROBLEMS IN MATERIALS ENGINEERING: Special assignments in materials engineering subject matter arranged and approved by the student's doctoral advisory committee and the program director. May be repeated. 1-3 sem. hrs.

**MAT 698. D.E. DISSERTATION:** An original investigation as applied to materials engineering practice. Results must be of sufficient importance to merit publication.  
*1-15 sem. hrs.*

**MAT 699. Ph.D. DISSERTATION:** An original research effort which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication.  
*1-15 sem. hrs.*

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## Department of

# **MECHANICAL ENGINEERING (MEE)**

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John J. Schauer, Chairperson of the Department

Mechanical Engineering is a major concentration for both the Doctor of Philosophy in Engineering and the Doctor of Engineering. See Doctor's Degree Regulations in the introductory section of this chapter and consult with the departmental chairperson and the director of the programs.

## **PROGRAM REQUIREMENTS**

For the Master of Science in Mechanical Engineering, major areas of concentration are Materials Engineering, Thermal Engineering, Fluid Mechanics, Solid Mechanics, Mechanical Design, and Integrated Manufacturing. Each program of study leading to this degree must include a minimum of 30 semester hours approved by the student's advisor, and consisting of the following:

1. Twelve semester hours in mechanical engineering courses to be selected from one of the following areas of concentration:  
Materials Engineering - MEE 500, 501, 502, 503, 505, 506, 508, 525, 570, 575, 590A.  
Thermal Engineering - MEE 500, 511, 512, 513, 514, 515, 516, 517, 565, 566, 567, 568, 569, 590B, 595.  
Fluid Mechanics - MEE 500, 503, 513, 516, 551, 553, 590C, 595.  
Solid Mechanics - MEE 500, 503, 533, 534, 535, 536, 538, 539, 543, 544, 545, 546, 547, 548, 549, 590D, 595.  
Mechanical Design - MEE 500, 503, 527, 532, 533, 534, 535, 536, 538, 539, 540, 543, 544, 545, 546, 547, 548, 549, 582, 585, 590E, 595.  
Integrated Manufacturing - MEE 500, 527, 545, 550, 580, 581, 582, 583, 584, 585, 590G, 595.
2. Six semester hours of research on a mechanical engineering project or thesis. Upon the request of the student and with the approval of the faculty advisor and the department chairperson, this requirement may be replaced by six semester hours of additional course work.



3. Up to 12 semester hours of electives, to be chosen from current course offerings which best suit the student's requirements and approved by the student's advisor.

See also Master's Degree Regulations in the introductory section of this chapter and consult with the advisor.

## COURSES OF INSTRUCTION

Students who have completed work equivalent to the prerequisite courses may be enrolled in these courses with the consent of the instructor.

**MEE 500. ADVANCED ENGINEERING ANALYSIS:** Detailed analysis of engineering problems using laws of nature, fundamental engineering principles, mathematics, computers and practical experience to construct, resolve and test analytic models of physical events. Emphasis is on the use of the professional engineering approach which includes formulation of the problem, assumptions, plan or method of attack, solving the problem, checking and generalizing the results. *3 sem. hrs.*

**MEE 501. PRINCIPLES OF MATERIALS I:** The electronic, atomic, submicroscopic, microscopic, and macroscopic structures of crystalline solids. Bonding, electron theory of metals, crystals, dislocations, phase diagrams, phase transformations, and diffusion. *3 sem. hrs.*

**MEE 502. PRINCIPLES OF MATERIALS II:** General introduction to the mechanical and electronic properties of materials, Elasticity: plasticity; creep; fracture; electrical and thermal processes; magnetic, dielectric, and optical properties. Prerequisite: MEE 501. *3 sem. hrs.*

**MEE 503. INTRODUCTION TO CONTINUUM MECHANICS:** Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics. Prerequisite: EGM 303. *3 sem. hrs.*

**MEE 505. THERMODYNAMICS OF SOLIDS:** Thermodynamic properties or solutions and intermediate phases. Equilibrium behavior of phase mixtures. Representation of multi-component phase diagrams. Experimental determination and prediction of phase diagrams. Prerequisites: MEE 502, or consent of instructor. *3 sem. hrs.*

**MEE 506. MECHANICAL BEHAVIOR OF MATERIALS:** Description of the state of stress and strain in materials, plastic deformation, fatigue, fracture, creep, and rupture. Prerequisite: MEE 502 or consent of instructor. *3 sem. hrs.*

**MEE 508. PRINCIPLES OF MATERIALS SELECTION:** Basic scientific and practical consideration involved in the intelligent selection of materials for specific applications. Impact of new developments in materials technology and analytical techniques. Prerequisite: MEE 501 or consent of instructor. *3 sem. hrs.*

**MEE 511. CLASSICAL THERMODYNAMICS:** Equilibrium, first law, second law, state principle, and zeroth law; development of entropy and temperature from availability concepts; chemical potential, chemical equilibrium, and phase equilibrium. Thermodynamics of irreversible processes; Onsager reciprocal relations; application of these concepts to direct energy conversion. *3 sem. hrs.*

**MEE 512. MICROSCOPIC THERMODYNAMICS:** Microscopic thermodynamics; kinetic theory; virial theorem of Clausius; transport phenomena; Gibbs, Boltzman, Bose-Einstein, Fermi-Dirac statistics. Connection between statistical and thermodynamic quantities. Applications to perfect and real gases, liquids, crystalline solids, and thermal radiation. Irreversible thermodynamics. *3 sem. hrs.*

**MEE 513. PROPULSION:** Principles of propulsive devices, aerothermodynamics, diffuser and nozzle flow, energy transfer in turbo-machinery, turbojet, turbo-fan, prop-fan engines, turbo-prop and turboshaft engines. RAM and SCRAM jet analysis and a brief introduction to related materials and air frame-propulsion interaction. Prerequisite: MEE 418. *3 sem. hrs.*

**MEE 514. DIRECT ENERGY CONVERSION:** Introduction to the principles of direct energy conversion. Irreversible thermodynamics; semiconductors; thermoelectric and photo-voltaic devices; magnetohydrodynamics; thermionic devices; fuel cells. Prerequisite: MEE 410. *3 sem. hrs.*

**MEE 515. CONDUCTION HEAT TRANSFER:** Steady state and transient state conduction. Evaluation of temperature fields by formal mathematics and numerical analysis. Emphasis on approximate solution techniques. *3 sem. hrs.*

**MEE 516. CONVECTION HEAT AND MASS TRANSFER:** Development of governing differential equations for convection. Methods of solution including similarity methods, integral methods, and superposition of solutions. Turbulent flow convection; integral methods, eddy diffusivities for heat and momentum. Extensions to mass transfer. Prerequisite: MEE 410 or equivalent. *3 sem. hrs.*

**MEE 517. RADIATION HEAT TRANSFER:** Fundamental relationships of radiation heat transfer. Radiation characteristics of surfaces. Geometric considerations in radiation exchange between surfaces. Emissivity and absorptivity of gases. Introduction to radiative exchange in gases. *3 sem. hrs.*

**MEE 525. PRINCIPLES OF CORROSION:** Application of electrochemical principles, corrosion reactions, passivation, cathodic and anodic protection, stress corrosion, and high temperature oxidation. *3 sem. hrs.*

**MEE 527. AUTOMATIC CONTROL THEORY:** Analysis and synthesis of feedback control systems; including hydraulic, pneumatic, mechanical and electrical systems. Frequency response; linear state space techniques; stability analysis; nonlinear system analysis and Liapunov stability. Prerequisite: ELE 432 or MEE 435 or equivalent, Computer Programming. *3 sem. hrs.*

**MEE 532. ACOUSTICS:** Physics of sound propagation, psychological effects of noise, noise control criteria and regulations, transmission phenomena, acoustics of walls and enclosures, resonators and filters, acoustic properties of materials, acoustic consideration in structural and machine design. *3 sem. hrs.*

**MEE 533. THEORY OF ELASTICITY:** Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution; plane stress and plane strain; energy formulations; numerical solution procedures. Corequisite: EGM 503. *3 sem. hrs.*

**MEE 534. THEORY OF PLATES AND SHELLS:** Theory of plates: small and large displacement theories of this plates; shear deformation; buckling; sandwich plate theory. This shell theory: theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories. Prerequisite: EGM 533.

*3 sem. hrs.*

**MEE 535. ADVANCED MECHANICAL VIBRATIONS:** Review of undamped, damped, natural and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problem, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems. Prerequisite: Computer Programming and MEE 319.

*3 sem. hrs.*

**MEE 536. RANDOM VIBRATIONS:** Introduction to probability distribution; characterization of random vibrations; harmonic analysis; auto- and cross-correlation and spectral density; coherence; response to single and multiple loadings; Fast Fourier Transform (FFT); applications in vibrations, vehicle dynamics, fatigue, etc. Prerequisites: Computer Programming and MEE 319.

*3 sem. hrs.*

**MEE 538. INTRODUCTION TO AEROELASTICITY:** The study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls.

*3 sem. hrs.*

**MEE 539. THEORY OF PLASTICITY:** Fundamentals of plasticity theory including: elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures. Prerequisite: EGM 503 or 533.

*3 sem. hrs.*

**MEE 540. BEARINGS AND BEARING LUBRICATION:** Theoretical aspects of lubrication; determination of pressure distribution in bearings from viscous flow theory; application of hydrodynamic and hydrostatic bearing theories to the design of bearings; high-speed bearing design problems; properties of lubricants; methods of testing.

*3 sem. hrs.*

**MEE 543. FUNDAMENTALS OF ADVANCED STRUCTURAL MATERIALS:** Introduction of anisotropic material and its complex behavior, comparison with isotropic material. Tools for analysis and design of aerospace structures with laminated composites. Classical laminated plate theory as a special case of the more general and complex anisotropic plate theory from practical application.

*3 sem. hrs.*

**MEE 544. STRUCTURAL BEHAVIOR OF COMPOSITES:** Comprehensive treatment of laminated plates and cylindrical shells. Bonding, buckling, and vibration analysis are considered. Various orders of theory and their range of parametric application are emphasized. Thermal stresses are also considered. Prerequisite: MEE 543.

*3 sem. hrs.*

**MEE 545. COMPUTATIONAL METHODS FOR DESIGN:** Modeling of mechanical systems and structures, analysis by analytical and numerical methods, development of mechanical design criteria and principles of optimum design, selected topics in mechanical design and analysis, utilization of the digital computer as an aid in the design of mechanical elements.

*3 sem. hrs.*

**MEE 546. FINITE ELEMENT ANALYSIS I:** Fundamentals of the Finite Element Method; interpolation functions; derivation of finite elements for bars, beams, plates, shells; isoparametric solid finite elements; isoparametric shell finite elements; natural vibration; elastic stability. Prerequisite: EGM 503 or 533. *3 sem. hrs.*

**MEE 547. FINITE ELEMENT ANALYSIS II:** Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature. Prerequisite: EGM 546. *3 sem. hrs.*

**MEE 548. ENERGY METHODS IN SOLID MECHANICS:** Development of fundamental energy principles; virtual displacements, strain energy, Castigliaro's theorems, minimum potential energy principles. Applications to engineering problems; redundant structures, buckling, static and dynamic analysis. Prerequisite: MEE 503 or MEE 533. *3 sem. hrs.*

**MEE 549. THEORY OF ELASTIC STABILITY:** Introduction to stability theory; buckling of plates and shells; influence of initial imperfections; nonlinear analysis; numerical solutions methods. Prerequisite: MEE 533. *3 sem. hrs.*

**MEE 550. MECHANICAL ENGINEERING PROJECT:** Student participation in a departmental research, design, or development project under the direction of a project advisor. The student must show satisfactory progress as determined by the project advisor and present a written report at the conclusion of the project. *1-6 sem. hrs.*

**MEE 551. VISCOUS FLOW:** Fundamentals of viscous flow. Navier-Stokes and boundary layer equations. Exact and approximate solutions of these equations using modern computational procedures for both laminar and turbulent flows. Prerequisite: MEE 503. *3 sem. hrs.*

**MEE 553. COMPRESSIBLE FLOW:** Fundamental equations of compressible flow, introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one-dimensional motion and shock tube theory. Method of surface singularities. Prerequisite: MEE 418. *3 sem. hrs.*

**MEE 565. FUNDAMENTALS OF COMBUSTION:** Heat of combustion and flame temperature calculations: rate of chemical reaction and Arrhenius relationship; theory of thermal explosions and the concept of ignition delay and critical mass; phenomena associated with hydrocarbon-air combustion: specific applications of combustion. *3 sem. hrs.*

**MEE 566. COMBUSTION THEORY:** Theory of detonation (Rankine-Hugoniot relationships) and flame propagation rates in pre-gas mixed systems: turbulent flames and the well-stirred reactor; theory of diffusion flames; fuel droplet combustion; steady burning of solid materials, ignition and flame spreading across solid materials. *3 sem. hrs.*

**MEE 567. SOLAR HEATING ANALYSIS:** Topics dealing with energy usage patterns; thermal insulation studies and energy conversion schemes; building heating load calculations; characteristics and measurement of solar radiation; analysis and testing of solar collectors; active and passive solar heating systems; economic trends of solar heating; heat pumps. *3 sem. hrs.*

**MEE 568. INTERNAL COMBUSTION ENGINES:** A study of combustion and energy release processes. Applications to spark and compression ignition, thermal jet, rocket, and gas turbine engines. Idealized and actual cycles are studied in preparation for laboratory testing of internal combustion engines. *3 sem. hrs.*

**MEE 569. HEATING AND AIR CONDITIONING:** Topics dealing with thermal environments and methods of control, Included are psychometrics, solar radiation, heat transmission through solid boundaries, industrial and residential environments, residential heating and cooling load calculations. *3 sem. hrs.*

**MEE 570. FRACTURE MECHANICS:** Application of principles of fracture mechanics to fatigue fracture in engineering structures. Prerequisite: MEE 502 or consent of instructor. *3 sem. hrs.*

**MEE 575. FATIGUE AND FRACTURE OF METALS AND ALLOYS:** Treatment of the effect of microstructures on the fatigue and fracture of engineering metals and alloys. Various analytical techniques in the failure analysis of structural components will be reviewed. Prerequisite: MEE 502, MEE 506 or consent of instructor. *3 sem. hrs.*

**MEE 580. PRODUCT AND PROCESS AUTOMATION:** General introduction to the modern techniques utilized in mechanical product and manufacturing process design. Topics in the various technologies associated with CAE/CAD/CAM/CIM. *3 sem. hrs.*

**MEE 581. COMPUTER-AIDED ENGINEERING:** Treatment of topics associated with the initial design, analysis and stimulation phase of the product development process. Development and use of analysis and stimulation tools. *3 sem. hrs.*

**MEE 582. AUTOMATED DESIGN:** Perform activities associated with the detailed design, drafting, and documentation of mechanical parts and components. Address system programming, system management requirements, modeling techniques and data base requirements. *3 sem. hrs.*

**MEE 583. AUTOMATED MANUFACTURING:** Treatment of topics associated with manufacturing engineering functions and issues in automation. Discuss numerical control, process planning, quality assurance, process simulation, manipulators, and other related technologies. *3 sem. hrs.*

**MEE 584. INTEGRATED MANUFACTURING SYSTEMS:** Address topics associated with the design, implementation, planning and control of fixed and flexible manufacturing and assembly systems in conjunction with communications and computer technologies. Discuss issues associated with group technology and systems integration. *3 sem. hrs.*

**MEE 585. DESIGN FOR PRODUCIBILITY:** Concurrent treatment of product design and manufacturing process issues. Application of various methodologies, tools and evaluation schemes on various product design, manufacturing, and assembly related activities. *3 sem. hrs.*

**MEE 590. SELECTED READINGS:** Directed readings in a designated area arranged and approved by the student's faculty advisor and the departmental chairperson. May be repeated. (A) Materials Engineering, (B) Thermal Engineering, (C) Energy Conversion, (D) Fluid Mechanics, (E) Solids Mechanics, (F) Mechanical Design, (G) Integrated Manufacturing. *1-6 sem. hrs. each*

**MEE 595. SPECIAL PROBLEMS IN MECHANICAL ENGINEERING:** Special assignments in mechanical engineering subject matter arranged and approved by the student's faculty advisor and the departmental chairperson. *1-6 sem. hrs.*

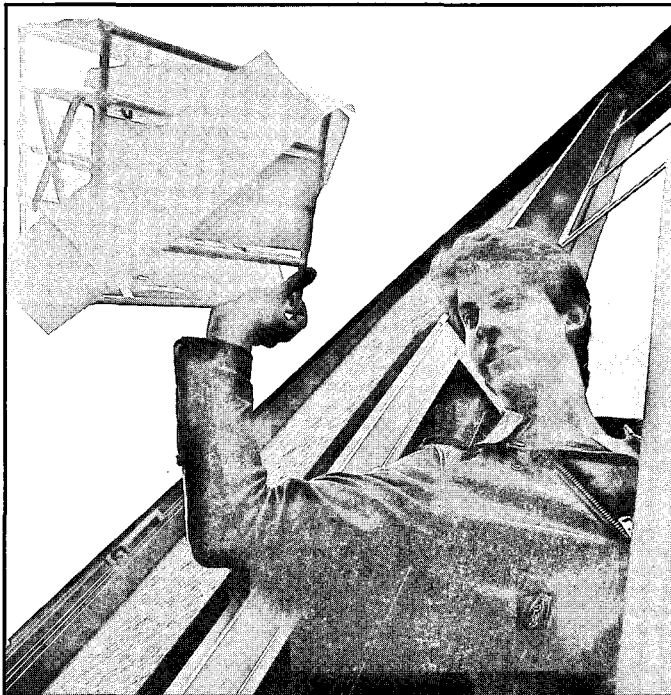
**MEE 599. THESIS.** *1-6 sem. hrs.*

**MEE 690. SELECTED READINGS:** Directed readings in a designated area arranged and approved by the student's doctoral advisory committee and the departmental chairperson. May be repeated. (A) Materials Engineering, (B) Thermal Engineering, (C) Fluid Mechanics, (D) Solid Mechanics (F) Mechanical Design. *1-6 sem. hrs. each*

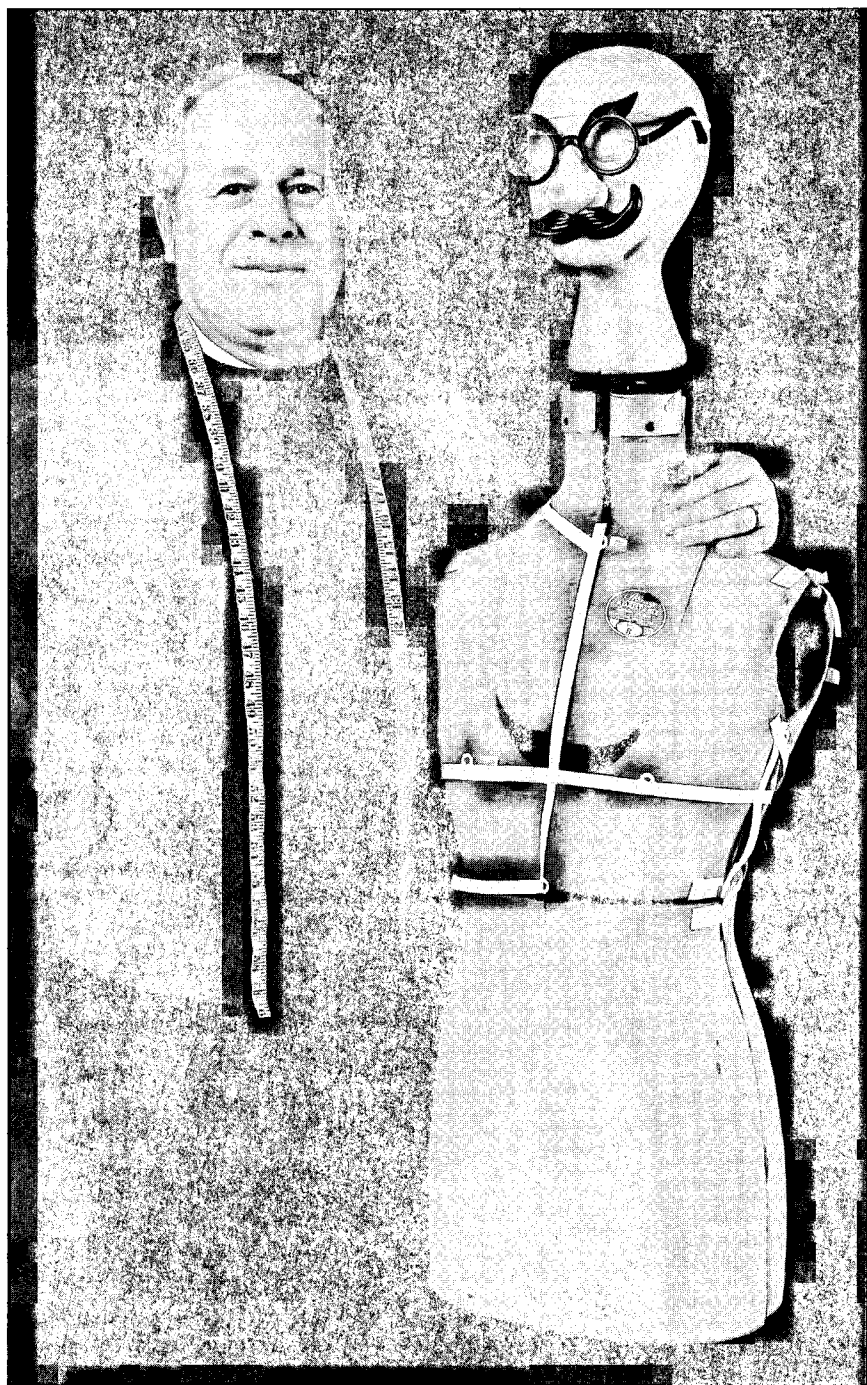
**MEE 695. SPECIAL PROBLEMS IN MECHANICAL ENGINEERING:** Special assignments in mechanical engineering subject matter arranged and approved by the student's doctoral advisory committee and the department chairperson. May be repeated. *1-6 sem. hrs.*

**MEE 698. D.E. DISSERTATION:** An original investigation as applied to mechanical engineering practice. Results must be of sufficient importance to meet publication. *1-15 sem. hrs.*

**MEE 699. Ph.D. DISSERTATION:** An original research effort which makes a definite contribution to technical knowledge. Result must be of sufficient importance to meet publication. *1-15 sem. hrs.*



*Winner, 1987 Engineering Egg Drop Contest.*



*Dana Rogers and his Engineering Fashion Program*

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- ALEXANDER, Roberta S. (1969), *History*, Associate Professor — A.B., University of California at Los Angeles, 1964; M.A., University of Chicago, 1966; Ph.D., University of Chicago, 1974.
- ANDERSON, Rev. William P. (1968), *Religious Studies*, Professor — A.B., Bloomfield College, 1961; B.D., Princeton Theological Seminary, 1964; Th.D., 1968.
- ARONS, Peter L. (1965), *English*, Associate Professor — A.B., New York University, 1957; M.A., Yale University, 1958; Ph.D., Yale University, 1964.
- AUGUST, Eugene R. (1966), *English*, Professor — B.A., Rutgers University, 1958; M.A., University of Connecticut, 1960; Ph.D., University of Pittsburgh, 1965.
- BAJPAL, Praphulla K. (1964), *Biology*, Professor — B.V. Sc. & A.H., Agra University, 1958; M.V. Sc., Agra University, 1960; M. Sc., Ohio State University, 1963; Ph.D., Ohio State University, 1965.
- BEAUREGARD, Erving E. (1947), *History*, Professor — A.B., University of Chicago, 1942; M.A., University of Massachusetts, 1944; Ph.D., Union Graduate School, 1976.
- BEDARD, Bernard J. (1962), *English*, Professor — A.B., University of Notre Dame, 1949; M.A., University of Michigan, 1950; Ph.D., University of Michigan, 1959.
- BERG, Berthold (1974), *Psychology*, Associate Professor — B.A., University of Michigan; M.S., Purdue University, 1971; Ph.D., Purdue University, 1974.
- BERNEY, Rex L. (1978), *Physics*, Associate Professor — B.S., University of Missouri at Columbia, 1971; M.S., University of Missouri at Columbia, 1973; Ph.D., University of Missouri at Columbia, 1978.
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- BLATT, Stephen J. (1971), *Communication*, Associate Professor — B.A., Morehead State University, 1964; M.A., Ohio University, 1967; Ph.D., Ohio University, 1969.
- BOULET, Richard A. (1968), *Religious Studies*, Professor — A.B., Providence College, 1954; S.T.B., S.T.L., S.T.Lr., Immaculate Conception College, 1956-1958; S.T.D., University of Montreal, 1965.
- BRANICK, Vincent P. (1979), *Arts and Sciences*, Associate Professor — B.A., Chaminade College of Honolulu, 1963; M.A., Catholic University of America, 1964; S.T.B., University of Fribourg, 1966; S.T.L., University of Fribourg, 1969; D.Phil., University of Fribourg, 1971; S.S.L., Pontifical Biblical Institute, Rome, 1972; Drs. Gregorian University, Rome, 1972; SS.D., Pontifical Biblical Institute, Rome, 1975.
- BURKY, Albert J. (1973), *Biology*, Associate Professor — B.A., Hartwick College, 1964; Ph.D., Syracuse University, 1969.
- BUTTER, Eliot J. (1971), *Psychology*, Professor — B.A., Brooklyn College, 1965; M.A., Brooklyn College, 1969; Ph.D., University of Massachusetts, 1971.
- CHANTELL, Charles J. (1965), *Biology*, Associate Professor — B.S., University of Illinois, 1961; M.S., University of Notre Dame, 1963; Ph.D., University of Notre Dame, 1965.

- COCHRAN, Bud T. (1958), *English*, Professor — B.A., College of Steubenville, 1955; M.A., Ohio State University, 1957; Ph.D., Ohio State University, 1967.
- CRAVER, Bruce A. (1978), *Physics*, Associate Professor — B.S., Purdue University, 1969; M.S., Purdue University, 1971; Ph.D., Purdue University, 1976.
- CUSELLA, Louis P. (1985), *Communication*, Associate Professor — B.A., Kent State University, 1972; M.A., Ohio State University, 1974; Ph.D., Purdue University, 1978.
- DAPOLITO, Frank J. (1970), *Psychology*, Professor — B.A., Bowling Green State University, 1959; Ph.D., Indiana University, 1966.
- EID, Leroy V. (1961), *History*, Professor — B.S. in Ed., University of Dayton, 1953; M.A., St. John's University, 1958; M.A., University of Toronto, 1968; Ph.D., St. John's University, 1961.
- FINE, Mark A. (1984), *Psychology*, Assistant Professor — B.A., Cornell University, 1979; M.A., The Ohio State University, 1981; Ph.D., The Ohio State University, 1983.
- FOGEL, Norman J. (1971), *Political Science*, Associate Professor — B.S., Millersville State College, 1960; M.A., University of Delaware, 1968; Ph.D., Ohio State University, 1975.
- FOX, B. Lawrence (1966), *Chemistry*, Professor — B.S., John Carroll University, 1962; Ph.D., Ohio State University, 1966.
- FRATINI, Albert V. (1967), *Chemistry*, Professor — B.S., University of Rhode Island, 1960; Ph.D., Yale University, 1966.
- FROST, Rev. William P. (1967), *Religious Studies*, Professor — Drs. Th., Carolus Magnus University (Netherlands), 1961; M.A., Loyola University, 1966.
- GANTNER, Thomas E. (1966), *Mathematics*, Associate Professor — B.S., University of Dayton, 1962; M.S., Purdue University, 1964; Ph.D., Purdue University, 1966.
- GEIGER, Donald R., S.M. (1964), *Biology*, Professor — B.S., University of Dayton, 1955; M.S., Ohio State University, 1960; Ph.D., Ohio State University, 1963.
- GORTON, Robert B. (1969), *Mathematics*, Associate Professor — B.S., Illinois Institute of Technology, 1964; M.S., Illinois Institute of Technology, 1966; Ph.D., Illinois Institute of Technology, 1970.
- GRAHAM, Thomas P. (1964), *Physics*, Professor — B.S., Providence College, 1956; Ph.D., Iowa State University, 1967.
- HARWOOD, Phillip J. (1966), *Communication*, Associate Professor — B.S., Butler University, 1960; M.S., Butler University, 1961; Ph.D., Ohio University, 1972.
- HATER, Robert J. (1981), *Religious Studies*, Professor — B.A., Athenaeum of Ohio, 1957; M.A., 1959; Ph.D., St. John's University, 1967.
- HEFT, Rev. James L., S.M. (1978), *Religious Studies*, Assistant Professor — B.A., B.S. Ed., University of Dayton, 1966; M.A., University of Toronto, 1971; Ph.D., University of Toronto, 1977.
- HENNINGER, Francis J. (1965), *English*, Associate Professor — B.A., St. John's University, 1956; M.A., University of Notre Dame, 1958; M.A., University of Pennsylvania, 1962; Ph.D., University of Pennsylvania, 1965.
- HERBENICK, Raymond M. (1968), *Philosophy*, Professor — B.A., Duquesne University, 1964; M.A., DePaul University, 1965; M.B.A., University of Pittsburgh, 1968; Ph.D., Georgetown University, 1968.

- INSCHO, Frederick R. (1976), *Political Science*, Assistant Professor — A.B., University of Detroit, 1968; M.A., State University of New York at Buffalo, 1972; Ph.D., State University of New York at Buffalo, 1976.
- JACOBSON, Marsha B. (1972), *Psychology*, Associate Professor — B.A., State University of New York at Buffalo, 1968; Ph.D., New York University, 1972.
- JEHN, Lawrence A. (1946), *Computer Science*, Professor — B.M.E., University of Dayton, 1943; M.S., University of Michigan, 1949. Reg. Prof. Engr.
- KEIL, Robert G. (1969), *Chemistry*, Professor — B.S., Villanova University, 1963; Ph.D., Temple University, 1967.
- KEPES, Joseph J. (1962), *Physics*, Professor — B.S., Case Institute of Technology, 1953; Ph.D., University of Notre Dame, 1958.
- KERNS, Gerald E. (1967), *Political Science*, Associate Professor — B.A., University of Wichita, 1961; Ph.D., Indiana University, 1969.
- KIMBLE, Charles E. (1973), *Psychology*, Associate Professor — B.A., Baylor University, 1966; M.A., Baylor University, 1969; Ph.D., University of Texas, 1972.
- KNACHEL, Howard C. (1972), *Chemistry*, Associate Professor — B.S., University of Dayton, 1963; M.S., Ohio State University, 1969; Ph.D., Ohio State University, 1971.
- KOHMESCHER, Rev. Matthew F., S.M. (1951), *Religious Studies*, Professor — A.B., University of Dayton, 1942; S.T.D., University of Fribourg, 1950; M.A., Western Reserve University, 1956.
- KORTE, John R. (1973), *Psychology*, Associate Professor — B.A., University of California, Berkeley, 1967; M.S., Purdue University, 1969; Ph.D., Purdue University, 1973.
- KUNKEL, Joseph C. (1964), *Philosophy*, Professor — A.B., Loyola University, 1958; A.M., Loyola University, 1962; Ph.D., St. Bonaventure University, 1968.
- LANG, Joseph E. (1981), *Computer Science*, Associate Professor — A.B., Thomas More College, 1964; M.S., University of Illinois, 1965; Ph.D., University of Illinois, 1970.
- LAPITAN, Antonio E. (1969), *Political Science*, Professor — A.B., University of the Philippines, 1954; M.A., Lehigh University, 1957; Ph.D., University of Oregon, 1968.
- LHEUREUX, Conrad E. (1970), *Religious Studies*, Professor — B.A., St. Paul's College, 1962; M.A., Catholic University of America, 1966; Ph.D., Harvard University, 1972.
- LUCIER, John J., S.M. (1945), *Chemistry*, Professor — B.S., University of Dayton, 1937; M.S., Western Reserve University, 1950; Ph.D., Western Reserve University, 1951.
- MCCLOSKEY, John W. (1965), *Mathematics*, Professor — B.S., University of Dayton, 1960; M.S., Michigan State University, 1962; Ph.D., Michigan State University, 1965.
- MCDUGALL, Kenneth J. (1966), *Biology*, Professor — B.A., Northland College, 1957; M.S., Marquette University, 1959; Ph.D., Kansas State University, 1964.
- MARAS, Raymond J. (1959), *History*, Professor — B.A., University of California, 1946; M.A., Catholic University of America, 1948; Ph.D., University of California, 1955.
- MARRE, Kitayun E. (1966), *English*, Professor — B.A., University of Bombay, 1958; M.A., University of Bombay, 1960; Ph.D., State University of New York at Buffalo, 1966.
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- MARTIN, Thomas M. (1965), *Religious Studies*, Professor — B.S., Spring Hill College, 1962; M.A., Fordham University, 1965; Ph.D., Syracuse University, 1972.
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- NELSON, Peter B. (1979), *Political Science*, Assistant Professor — B.S., Florida State University, 1969; B.S., Florida International University, 1973; M.S.M., Florida International University, 1975; Ph.D., University of Mississippi, 1982.
- NOLAND, George B. (1966), *Biology*, Professor — B.S., University of Detroit, 1950; M.S., University of Detroit, 1952; Ph.D., Michigan State University, 1955.
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- RANG, Jack C. (1979), *Communication*, Professor — B.S., Northwestern University, 1948; M.A., Aquinas College, 1965; Ph.D., Northwestern University, 1972.
- RHEE, Tong-Chin (1967), *History*, Professor — B.A., Seoul National University, 1959; M.P.A., School of Public Administration, Seoul National University, 1961; M.A., Lehigh University, 1962; Ph.D., Clark University, 1967.
- RICHARDS, William M. (1970), *Philosophy*, Associate Professor — B.A., LeMoyné College, 1966; Ph.D., Georgetown University, 1970.
- ROBERTS, William P. (1980), *Religious Studies*, Professor — B.A., Fordham University, 1955; M.A., Fordham University, 1957; Ph.L., Loyola Seminary, 1956; S.T.L., Weston College School of Theology, 1963; Ph.D., Marquette University, 1968.
- ROBINSON, James D. (1982), *Communication*, Assistant Professor — B.A., University of the Pacific, 1978; M.A., West Virginia University, 1979; Ph.D., Purdue University, 1982.

- ROWE, John J. (1977), *Biology*, Associate Professor — B.S., Colorado State University, 1967; M.S., Arizona State University, 1971; Ph.D., University of Kansas Medical Center, 1975.
- RUFF, Lawrence A. (1960), *English*, Associate Professor — B.S., University of Dayton, 1958; M.A., Catholic University of America, 1959; Ph.D., Ohio State University, 1968.
- SINGER, Sanford S. (1972), *Chemistry*, Professor — B.S., Brooklyn College, 1962; M.S., University of Michigan, 1964; Ph.D., University of Michigan, 1967.
- SKILL, Thomas D. (1984), *Communication*, Assistant Professor — B.A., State University of New York at Buffalo, 1978; M.A., State University of New York at Buffalo, 1980; Ph.D., State University of New York at Buffalo, 1984.
- STEINER, Wilfred J. (1946), *History*, Professor — A.B., Loras College, 1936; M.A., Harvard University, 1938; Ph.D., Ohio State University, 1957.
- STEINLAGE, Ralph C. (1966), *Mathematics*, Professor — B.S., University of Dayton, 1962; M.S., Ohio State University, 1963; Ph.D., Ohio State University, 1966.
- THOMPSON, Teresa L. (1985), *Communication*, Associate Professor — B.A., University of Wisconsin, 1975; M.A., Purdue University, 1976; Ph.D., Temple University, 1980.
- TIBBETTS, Paul E. Jr. (1969), *Philosophy*, Professor — A.E., Worcester Junior College, 1959; B.A., Clark University, 1964; M.A., Boston University, 1965; Ph.D., Purdue University, 1973.
- ULRICH, Lawrence P. (1964), *Philosophy*, Professor — A.B., Catholic University of America, 1961; M.A., Catholic University of America, 1962; M.Ed., Xavier University, 1964; Ph.D., University of Toronto, 1972.
- VENTULLO, Roy M. (1979), *Biology*, Associate Professor — B.S., State University of New York at Brockport, 1972; M.S., State University of New York at Brockport, 1974; Ph.D., University of Georgia, 1978.
- VESPER, Mary J. (1982), *Biology*, Assistant Professor — B.A., Thomas More College, 1973; M.S., Ohio State University, 1975; Ph.D., Ohio State University, 1978.
- VINES, Alice G. (1969), *History*, Associate Professor — B.A., B.S. in Ed., University of Cincinnati, 1960; M.A., University of Cincinnati, 1961; Ph.D., University of Cincinnati, 1975.
- WALLACE, Samuel P. (1982), *Communication*, Assistant Professor — B.A., Ohio State University, 1975; M.A., 1979; M.A., 1979; Ph.D., 1985.
- WEATHERLY, Michael (1968), *Communication*, Assistant Professor — B.A., Stephen F. Austin State College, 1958; M.A., Bowling Green State University, 1961; Ph.D., Ohio State University, 1972.
- WINSLOW, Leon E. (1981), *Computer Science*, Professor — B.S., Marquette University, 1965; M.S. Marquette University, 1960; Ph.D. Duke University, 1956.
- WOLFF, Florence I. (1969), *Communication*, Professor — B.S., Temple University, 1941; M.Ed., Duquesne University, 1967; Ph.D., University of Pittsburgh, 1969.
- YANEY, Perry P. (1965), *Physics*, Professor — B.S.E.E., University of Cincinnati, 1954; M.S., University of Cincinnati, 1957; Ph.D., University of Cincinnati, 1963.
- ZEMBARTY, Jane S. (1975), *Philosophy*, Associate Professor — B.A., State University of New York at Buffalo, 1971; M.A., Georgetown University, 1974; Ph.D., Georgetown University, 1976.



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- AMSDEN, Robert T. (1978), *Decision Sciences*, Associate Professor — B.A., University of New Hampshire, 1960; M.S., Rutgers, The State University, 1964; Ph.D., Rutgers, The State University, 1969.
- BALLOUN, Joseph L. (1981), *Management*, Associate Professor — B.S., Iowa State University, 1963; M.S., Iowa State University, 1965; Ph.D., University of California, 1971.
- BERGER, Robert M. (1964), *Management*, Assistant Professor — B.S., University of Dayton, 1960; M.A., Ohio University, 1963; J.D., Chase School of Law, 1970.
- BLODGET, Elweyn C. (1982), *Economics and Finance*, Assistant Professor — B.S., Purdue University, 1966; M.B.A., University of Utah, 1972; Ph.D., University of Utah, 1980.
- BOHLEN, George A. (1980), *Decision Sciences*, Associate Professor — B.S.M.E., Clemson University, 1958; M.S.I.E., Purdue University, 1963; M.S.B.A., George Washington University, 1968; Ph.D., Purdue University, 1973.
- BRADY, Thomas J. (1981), *Accounting*, Associate Professor — B.S., New York University, 1966; M.B.A., Adelphi University, 1968; Ph.D., Purdue University, 1976.
- BURROWS, Ron J. (1981), *Accounting*, Associate Professor — B.S., Northern Illinois University, 1965; M.S., Northern Illinois University, 1968; Ph.D., Pennsylvania State University, 1980.
- CHEN, Carl R. (1977), *Economics and Finance*, Associate Professor — B.A., National Taiwan University, 1969; M.S., Auburn University, 1973; Ph.D., University of Georgia, 1977.
- CHITTIPEDDI, Kumar (1986), *Management*, Assistant Professor — B.C., University of Bombay, India, 1978; M.B.A., Oklahoma State University, 1981; Ph.D., Pennsylvania State University, 1986.
- CLARK, Willard C., Jr. (1963), *Accounting*, Associate Professor — B.S., University of Dayton, 1959; M.B.A., Miami University, 1960; C.P.A., Ohio, 1962.
- DUNNE, Edward J. (1982), *Decision Sciences*, Professor — B.S., St. Louis University, 1962; M.S., Air Force Institute of Technology, 1964; Ph.D., University of Illinois, 1971.
- ELEY, Marion J. (1961), *Accounting*, Associate Professor — B.S., University of Dayton, 1959; M.B.A., Xavier University, 1964; C.P.A., Ohio, 1966.
- EMMELHAINZ, Margaret A. (1986), *Marketing*, Assistant Professor — B.A., Trinity University, 1973; M.S., Air Force Institute of Technology, 1979; Ph.D., Ohio State University, 1986.
- FERRATT, Thomas W. (1986), *Decision Sciences*, Professor — B.B.A., University of Notre Dame, 1968; M.B.A., Ohio State University, 1973; Ph.D., Ohio State University, 1974.
- FIORITI, Andrew A. (1965), *Accounting*, Associate Professor — B.S., University of Scranton, 1956; M.B.A., University of Detroit, 1958; C.P.A., New Jersey, 1964.
- FRASCA, Ralph R. (1972), *Economics and Finance*, Associate Professor — B.A., C.W. Post College, 1967; M.A., Indiana University, 1971; Ph.D., Indiana University, 1975.
- GEARY, K. Michael (1976), *Accounting*, Associate Professor — B.S., Indiana University, 1969; M.B.A., Miami University, 1974; Ph.D., University of Cincinnati, 1982; C.P.A., Illinois, 1975; C.P.A., Ohio, 1976.

- GHOSH, Jayabrata (1983), *Decision Sciences*, Assistant Professor — B.T., Indiana Institute of Technology, 1977; M.S., University of Arkansas, 1981; Ph.D., University of Arkansas, 1983.
- GOMOLKA, Eugene G. (1986), *Management*, Professor — B.S., Carnegie-Mellon University, 1967; M.B.A., University of Pittsburgh, 1968; Ph.D., State University of New York at Buffalo, 1974.
- GOULD, Sam (1985), *Management*, Professor — B.S., Ohio University, 1964; M.B.A., University of Colorado, 1970; Ph.D., Michigan State University, 1975.
- GUSTAFSON, Elizabeth F. (1983), *Economics and Finance*, Associate Professor — B.A., Duke University, 1970; Ph.D., University of North Carolina, 1974.
- HADLEY, Lawrence H. (1977), *Economics and Finance*, Associate Professor — B.A., Rutgers University, 1967; M.A., University of Connecticut, 1969; Ph.D., University of Connecticut, 1975.
- HOBEN, William J. (1956), *Accounting*, Professor — B.S., University of Dayton, 1950; M.B.A., Xavier University, 1960; C.P.A., Ohio, 1960.
- KING, Alan L. (1972), *Marketing*, Associate Professor — B.S., Ohio State University, 1967; M.A., Ohio State University, 1969; Ph.D., Ohio State University, 1972.
- LEWIS, William F. (1980), *Marketing*, Associate Professor — B.A., Spring Arbor College, 1967; M.B.A., Michigan State University, 1969; Ph.D., University of Cincinnati, 1976.
- MERENSKI, J. Paul (1976), *Marketing*, Associate Professor — B.S., Wright State University, 1971; M.B.A., Wright State University, 1972; Ph.D., University of Cincinnati, 1982.
- MILLER, Richard L. (1968), *Management*, Associate Professor — B.S., Ohio State University, 1947; M.B.A., Ohio State University, 1959; Ph.D., University of Cincinnati, 1981.
- OUMLIL, Abderrahman B. (1983), *Marketing*, Assistant Professor — B.S., Southwest Missouri State University, 1976; M.B.A., University of Arkansas, 1977; Ph.D., University of Arkansas, 1983.
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- RAPP, John E. (1972), *Economics and Finance*, Professor — B.A., University of Missouri, 1959; M.A., University of Missouri, 1960; Ph.D., University of Missouri, 1964.
- RIPPY, Douglas V. (1980), *Decision Sciences*, Associate Professor — B.S., Clemson University, 1964; M.S., Air Force Institute of Technology, 1968; Ph.D., Clemson University, 1974.
- ROSENZWEIG, Kenneth Y. (1981), *Accounting*, Associate Professor — B.A., University of Texas, 1965; M.B.A., University of Houston, 1968; Ph.D., Michigan State University, 1977.
- SCHEIDLER, Charles H. (1953), *Management*, Professor — A.B., Washington University, 1949; Ph.D., Washington University, 1953.
- SCHENK, Joseph A. (1980), *Management*, Associate Professor — B.B.A., University of Kentucky, 1970; M.B.A., Kent State University, 1972; D.B.A., Kent State University, 1976.
- SEKELY, William S. (1976), *Marketing*, Associate Professor — B.S., Allegheny College, 1966; M.B.A., Case Western Reserve, 1970; D.B.A., Kent State University, 1975.

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- TEWARI, Harish C. (1975), *Management*, Associate Professor — B.B.A., Delhi University, 1963; M.B.A., Central Michigan University, 1969; M.A., University of Cincinnati, 1974; Ph.D., University of Cincinnati, 1977.
- VLACHOS, George E. (1978), *Decision Sciences*, Professor — B.S., University of Illinois Urbana, 1964; M.S., Southern Illinois University, 1967; Ph.D., University of Northern Colorado, 1974.
- VORHERR, Phillip H. (1980), *Accounting*, Associate Professor — B.B.A., University of Cincinnati, 1964; M.B.A., University of Cincinnati, 1965; Ph.D., University of Cincinnati, 1975.
- WEILER, John E. (1967), *Economics and Finance*, Associate Professor — B.A., University of Cincinnati, 1960; M.A., University of Cincinnati, 1961; Ph.D., University of Cincinnati, 1973.
- WELLS, Charles E. (1984), *Decision Sciences*, Associate Professor — A.B., Harvard University, 1976; M.B.A., Miami University, 1977; Ph.D., University of Cincinnati, 1982.
- WINGER, Bernard J. (1966), *Economics and Finance*, Associate Professor — B.S., Xavier University, 1959; M.A., University of Cincinnati, 1960; C.P.A., Ohio, 1965.
- YATES, Rebecca M.J. (1980), *Marketing*, Associate Professor — B.B.A., University of Cincinnati, 1973; M.B.A., University of Cincinnati, 1975; Ph.D., University of Cincinnati, 1980.
- YOUNG, Saul (1983), *Decision Sciences*, Associate Professor — B.A., University of Texas, 1962; M.S., University of Wisconsin, 1969; Ph.D., Stanford University, 1975.

## EDUCATION GRADUATE FACULTY

- ANDERSON, Gordon S. (1969), *Elementary Education*, Associate Professor — B.A., Bethany College, 1953; M.S., State University of New York, 1959; Ed.D., Case Western Reserve University, 1969.
- BRITT, John F. (1966), *Teacher Education*, Professor — B.A., St. Paul Seminary, 1950; M.A., St. Louis University, 1954; Ph.D., St. Louis University, 1962.
- CARLSEN, Roger N. (1981), *Teacher Education*, Associate Professor — B.S. Ed., Northern Illinois University, 1967; M.S. Ed., Chicago State University, 1972; Ed.D., Western Michigan University, 1979.
- CHAVEZ, Simon J. (1954), *Educational Administration*, Professor Emeritus — A.B., Adams State College, 1938; M.Ed., University of Colorado, 1947; D.Ed., University of Colorado, 1952.
- DIETHORN, Bernard C., S.M. (1966), *Counselor Education and Human Services*, Professor — B.A., University of Dayton, 1942; M.A., Western Reserve University, 1952; Ed.D., Western Reserve University, 1966.
- DREES, Doris A. (1956), *Physical and Health Education*, Professor — B.S., University of Dayton, 1954; M.A., Ohio State University, 1959; Ph.D., University of Iowa, 1968.
- DRURY, William R. (1984), *Educational Administration*, Associate Professor — B.S., University of Dayton, 1958; M.S., University of Dayton, 1962; Ed.D., Wayne State University, 1971.
- EVANS, James H. (1981), *Counselor Education*, Associate Professor — B.A., Ohio Wesleyan University, 1961; M.A., Kent State University, 1964; Ed.D., Indiana University, 1971.
- FRERICKS, Donald J. (1978), *Educational Administration*, Associate Professor — B.S., University of Dayton, 1956; M.A., Miami University, 1958; Ph.D., Ohio State University, 1970.
- FRYE, Helen B. (1967), *Teacher Education*, Professor — B.A., Ohio Wesleyan University, 1944; M.Ed., Wittenberg University, 1962; Ph.D., Ohio State University, 1967.
- FUCHS, Gordon E. (1967), *Teacher Education*, Professor — B.S., University of Wisconsin, 1958; M.S., University of Wisconsin, 1961; Ph.D., Ohio State University, 1974.
- GAY, James E. (1968), *Teacher Education*, Professor — B.A., Ohio University, 1951; M.A., University of Wisconsin, 1956; D.Ed., University of Maryland, 1972.
- GEIGER, John O. (1970), *Teacher Education*, Associate Professor — B.A., Marquette University, 1966; Ph.D., Marquette University, 1972.
- HARAWA, Bernard A. (1977), *Educational Administration*, Assistant Professor — Dip. Ed., Stranmillis College, Belfast, Ireland, 1961; B.S.Ed., University of Dayton, 1965; M.S.Ed., University of Dayton, 1967; Ed.D., Teachers College, Columbia University, 1974.
- HOPFENGARDNER, Jerrold D. (1978), *Educational Administration*, Associate Professor — B.S., University of Dayton, 1959; M.Ed., Miami University, 1961; Ph.D., Ohio State University, 1970.
- JOSEPH, Ellis A. (1961), *Teacher Education*, Professor — A.B., University of Notre Dame, 1955; M.A., University of Notre Dame, 1956; Ph.D., University of Notre Dame, 1962.

- LASLEY, Thomas J., II (1983), *Teacher Education*, Associate Professor — B.S., Ohio State University, 1969; M.A., Ohio State University, 1972; Ph.D., Ohio State University, 1978.
- LAUBACH, Lloyd L. (1980), *Physical and Health Education*, Associate Professor — B.S., Central State University, Edmond, Oklahoma, 1961; M.S., University of Oregon, 1962; Ph.D., Ohio State University, 1970.
- LAVANCHE, James B. (1957), *Physical and Health Education*, Professor — B.A., Emory and Henry College, 1948; M.S., West Virginia University, 1952.
- LEONARD, Mary T. (1956), *Physical and Health Education*, Associate Professor — B.A., Radcliffe College, 1948; M.S., MacMurray College, 1951; D.Ed., Boston University, 1960.
- LUTZ, Paul N. (1970), *Teacher Education*, Assistant Professor — B.S., University of Washington, 1955; B.A., University of Washington, 1955; M.Ed., University of Oregon, 1967; Ph.D., University of Oregon, 1970.
- McCORMICK, Roger D. (1981), *Counselor Education*, Associate Professor — B.S.Ed., Miami University, 1949; M.A., Ohio State University, 1957; Ph.D., Ohio State University, 1969.
- MORTON, M. Byron (1967), *Educational Administration*, Associate Professor — B.A., Wittenberg University, 1929; M.A., Ohio State University, 1935.
- MOULIN, Eugene K. (1968), *Counselor Education and Human Services*, Professor — B.A., Mount Union College, 1956; M.E., Kent State University, 1959; Ph.D., University of Toledo, 1968.
- O'NEIL, Gerald W., S.M. (1980), *Teacher Education*, Associate Professor — B.A., University of Dayton, 1956; M.A., Saint John's University, 1963; Ph.D., University of Notre Dame, 1975.
- PETIT, Sister Loretta M., O.P. (1968), *Teacher Education*, Associate Professor — B.A., Sienna Heights College, 1942; M.A., Catholic University of America, 1949; D.Ed., Western Reserve University, 1966.
- REVERE, Amie L. (1981), *Counselor Education*, Associate Professor — B.S., Central State University 1957; M.Ed., Miami University, 1970; Ph.D., Miami University, 1985.
- ROGUS, Joseph F. (1981), *Educational Administration*, Professor — B.S., University of Dayton, 1960; M.Ed., Miami University, 1962; Ph.D., Ohio University, 1968.
- RUETH, Thomas W. (1987), *Counselor Education and Human Services*, Associate Professor — B.S., University of Dayton, 1963; M.A., University of Dayton, 1968; Ph.D. Loyola University, 1973.
- SCHLEPPI, John R.. (1963), *Physical and Health Education*, Associate Professor — B.S., Ohio State University, 1961; M.B.A., Ohio State University, 1963; Ph.D., Ohio State University, 1972.
- SHUGARMAN, Sherrie L. (1983), *Teacher Education*, Assistant Professor — B.Ed., University of Toledo, 1975; M.Ed., University of Toledo, 1977; Ph.D., Claremont Graduate School, 1983.
- TORGE, Herman (1976), *Educational Services*, Associate Professor — B.S., Miami University, 1946; M.M., Cincinnati Conservatory of Music, 1951; M.A., Miami University, 1968; Ph.D., Miami University, 1970.
- WATRAS, Joseph (1979), *Teacher Education*, Assistant Professor — B.A., Boston University 1965; M.Ed., University of Hawaii, 1969; Ph.D., Ohio State University, 1972.
- WEAVER, Roberta B. (1978), *Teacher Education*, Associate Professor — B.Sc. in Ed., Ohio State University, 1960; M.Sc., in Ed., University of Cincinnati, 1966; Ed.D., University of Cincinnati, 1982.

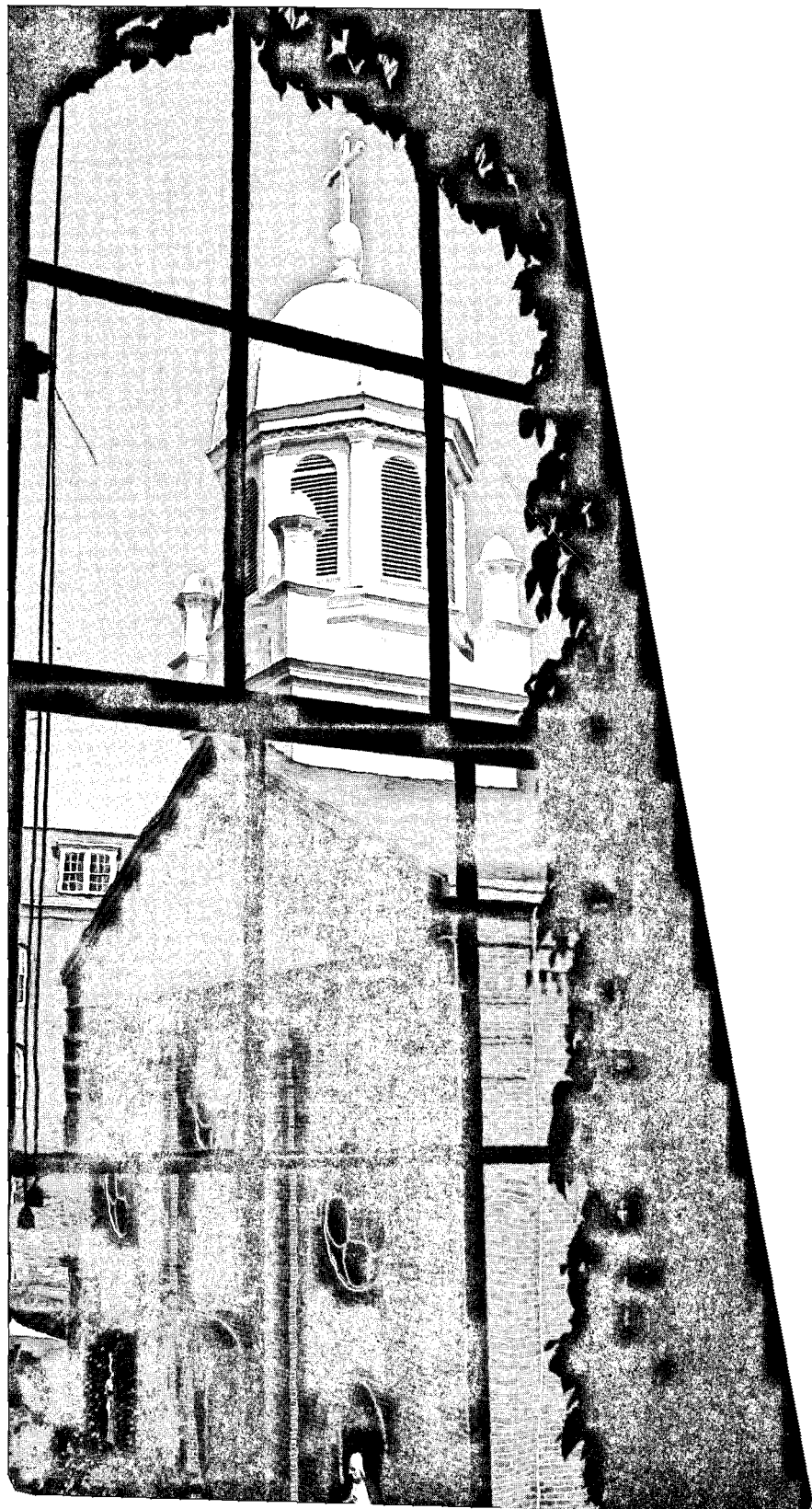
## ENGINEERING GRADUATE FACULTY

- BOEHMAN, Louis I. (1967), *Mechanical Engineering*, Professor — B.S.M.E., University of Dayton, 1960; M.S.M.E., Illinois Institute of Technology, 1963; Ph.D., Illinois Institute of Technology, 1967; Reg. Prof. Engr.
- BOGNER, Fred K. (1969), *Civil Engineering and Engineering Mechanics*, Professor — B.S.C.E., Case Institute of Technology, 1961; M.S.E. Mech., Case Institute of Technology, 1964; Ph.D., Case Institute of Technology, 1967.
- BROCKMAN, Robert A. (1984), *Mechanical Engineering*, Associate Professor — B.S.M.E., Carnegie-Mellon University, 1973; M.M.E., University of Dayton, 1974; Ph.D., University of Dayton, 1979.
- CHARTOFF, Richard P. (1981), *Materials Engineering*, Professor — B.S. Case Western Reserve, 1961; M.S.E., Princeton, 1962; M.A., Princeton, 1965; Ph.D., Princeton, 1968.
- DOYLE, George R. (1982), *Mechanical Engineering*, Professor — B.S., Purdue University, 1965; M.S., Purdue University, 1967; Ph.D. University of Akron, 1973., Reg. Prof. Engr.
- EASTEP, Franklin E. (1980), *Aerospace Engineering*, Professor — B.S., Ohio State University, 1958; M.S., Air Force Institute of Technology, 1963; Ph.D., Stanford University, 1968.
- EVERS, Anthony J. (1966), *Electrical Engineering*, Associate Professor — B.E.E., University of Dayton, 1953; M.S.E.E., University of Notre Dame, 1955; Reg. Prof. Engr.
- EYLON, Daniel, (1987), *Materials Engineering*, Associate Professor — B.Sc., Technion, Israel Institute of Technology, 1966; M.Sc., Technion, Israel Institute of Technology, 1968; D.Sc., Technion, Israel Institute of Technology, 1972.
- FITZ, Raymond L., S.M. (1969), *Electrical Engineering and Engineering Management*, Professor — B.E.E., University of Dayton, 1964; M.S., Polytechnic Institute of Brooklyn, 1967; Ph.D., Polytechnic Institute of Brooklyn, 1970.
- FRAKER, John R. (1975), *Engineering Management and Management Science*, Professor — B.S., University of Tennessee, 1956; M.S., University of Tennessee, 1965; Ph.D., Clemson University Illinois, 1968, Prof. Engr.
- GALLAGHER, Joseph P. (1981), *Materials Engineering*, Professor — B.Sc.E., Drexel University, 1964; M.S., University of Illinois, 1965; Ph.D., University of Illinois, 1968.
- HARMER, Richard S. (1971), *Mechanical Engineering*, Associate Professor — B.S., University of Illinois, 1963; M.S., University of Illinois, 1967; Ph.D., University of Illinois, 1971.
- HENRY, Donald L. (1978), *Engineering Management*, Associate Professor — B.S., University of Illinois, 1943; M.S., Ohio State University, 1953; Ph.D., Ohio State University, 1964.
- JAIN, Vinod K. (1979), *Mechanical Engineering*, Associate Professor — B.S.M.E., University of Roorkee, India, 1964; M.S.M.E., University of Roorkee, 1970; Ph.D., Iowa State University of Science and Technology, 1980.
- JONES, Eugene E. (1980), *Engineering Management and Management Science*, Associate Professor — B.A., Tennessee State University, 1965; M.A., Pennsylvania State University, 1976; Ph.D., Ohio State University, 1978.

- KARIM, Mohammad A. (1986), *Electrical Engineering*, Assistant Professor — B.S., Physics, University of Dacca, Bangladesh, 1976; M.S. Physics, University of Alabama, 1978; M.S.E.E., University of Alabama, 1980; Ph.D., University of Alabama, 1982.
- LEE, C. William (1982), *Chemical Engineering*, Assistant Professor — B.S., National Taiwan University, 1976; M.S., University of Akron, 1979; Ph.D., Ohio State University, 1982.
- LOOMIS, John S. (1979), *Electro-Optics*, Professor — B.S., Case Institute of Technology, 1966; M.S., University of Illinois, 1968; M.S., University of Arizona, 1977; Ph.D., University of Arizona, 1980.
- LU, Chris C. (1976), *Chemical Engineering*, Associate Professor — B.S., Chen-Kung University at Taiwan, 1960; M.S., University of Missouri at Rolla, 1966; Ph.D., University of Texas, 1972.
- MOON, Donald L. (1974), *Electrical Engineering and Electro-Optics*, Professor — B.S.E.E., West Virginia Institute of Technology, 1963; M.S.E.E., University of Toledo, 1966; Ph.D., Ohio State University, 1974.
- MURTHY, P. Krishna (1984), *Electrical Engineering*, Associate Professor — B.E., Andhra University, India, 1970; Ph.D., Indian Institute of Science, Bangalore, 1974.
- RAY, Alden E. (1961), *Mechanical Engineering*, Professor of Materials Engineering — B.A., Southern Illinois University, 1953; Ph.D., Iowa State University, 1959.
- ROGERS, Dana B. (1982), *Electrical Engineering*, Associate Professor — B.S.E.E., Arizona State University, 1962; M.S.E.E., Air Force Institute of Technology, 1969; U.D., University of Dayton, 1978.
- RYCKMAN, Seymour J. (1959), *Civil Engineering*, Retired Professor — B.S., Michigan State University, 1939; M.S., University of Missouri, 1942; Reg. Prof. Engr.
- SALIBA, Joseph (1980), *Civil Engineering and Engineering Mechanics*, Associate Professor — B.S., University of Dayton, 1979; M.S. University of Dayton, 1980; Ph.D., University of Dayton, 1983.
- SANDHU, Sarwan S. (1980), *Chemical Engineering*, Associate Professor — B.Sc., Panjab University, 1961; B.Sc.C.E., Panjab University, 1966; M.Sc.E., London, 1973; Ph.D., University of London, 1973.
- SANDY, Charles W. (1975), *Chemical Engineering*, Associate Professor — B.S., Pennsylvania State University, 1964; M.S., Pennsylvania State University, 1968; Ph.D., Pennsylvania State University, 1974.
- SARGENT, Gordon A. (1985), *Mechanical Engineering*, Professor — B.Sc., Imperial College of Science and Technology, University of London, 1960; Ph.D., Imperial College of Science and Technology, University of London, 1964.
- SCHAUER, John J. (1968), *Mechanical Engineering*, Professor — B.M.E., University of Dayton, 1958; M.S. Carnegie Institute of Technology, 1959; Ph.D., Stanford University, 1964.
- SCHMIDT, Bernhard M. (1949), *Electrical Engineering*, Professor — B.E.E., University of Dayton, 1942; M.Sc., Ohio State University, 1957; Ph.D., Ohio State University, 1963; Reg. Prof. Engr.
- SCOTT, James N. (1980), *Mechanical Engineering and Aerospace Engineering*, Associate Professor — B.S., Ohio State University, 1971; M.S., Ohio State University, 1972; Ph.D., Ohio State University, 1977.

- SERVAIS, Ronald A. (1974), *Chemical Engineering*, Professor — B.S.A.E., Parks College of St. Louis University, 1963; M.S., St Louis University, 1966; D.Sc., Washington University, 1969; Reg. Prof. Engr.
- SNIDE, James A. (1979), *Materials Engineering*, Professor — B.S.M.E., Ohio University, 1959; M.S., Air Force Institute of Technology, 1965; Ph.D., Ohio State University, 1976.
- STRNAT, Karl J. (1968), *Electrical Engineering*, Tait Professor — Ing. F. Maschinenbau, Technolog. Gewerbemuseum, Vienna, 1948; Dipl. Ing., Techn. Hochschule Wien, Vienna, 1953; Dr. Techn. Hochschule Wien Vienna, 1956.
- SWEENEY, Patrick J. (1978), *Engineering Management*, Professor — B.S., University of Notre Dame, 1957; M.S., University of Missouri, 1967; Ph.D., University of Dayton, 1977; Reg Prof. Engr.
- THIELE, Gary A. (1979), *Electrical Engineering*, Professor — B.S., Purdue University, 1960; M.S., Ohio State University, 1964; Ph.D., Ohio State University, 1968; Reg. Prof. Engr.
- THOMSON, Robert A. (1952), *Civil Engineering and Engineering Mechanics*, Professor — B.S. in Ed., University of Dayton, 1950; B.M.E., University of Dayton, 1954; Ph.D., Illinois Institute of Technology, 1985. Reg. Prof. Engr.
- VON OHAIN, Hans J.P. (1981), *Mechanical and Aerospace Engineering*, Adjunct Professor — Ph.D., University of Goettingen, Germany, 1935.
- WEEKS, Thomas M.. (1977), *Mechanical Engineering*, Adjunct Professor — B.S.M.E., Syracuse University, 1958; M.S.M.E., Ohio State University, 1965; Ph.D., Syracuse University, 1965.
- WESTERKAMP, John J. (1986), *Electrical Engineering*, Assistant Professor — B.E.E., University of Dayton, 1980; M.S.E.E., Purdue University, 1981; Ph.D., Purdue University, 1985.
- WILLIAMSON, Tommy L. (1981), *Electrical Engineering*, Assistant Professor — B.S.E.E., Ohio University, 1962; M.S.E.E., Ohio State University, 1965; Ph.D., Ohio State University, 1975.
- WURST, John C. (1971), *Mechanical Engineering*, Professor — B.M.E., University of Dayton, 1957; M.S.E., University of Dayton, 1968; Ph.D., University of Illinois, 1971; Reg. Prof. Engr.





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# UNIVERSITY OF DAYTON

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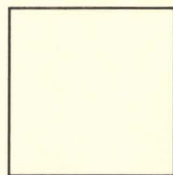
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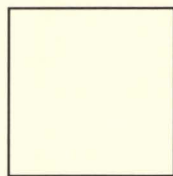
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# GRADUATE PROGRAMS

## INTERDISCIPLINARY AND JOINT STUDIES

American Studies (AMS)  
Clinical Laboratory Technology  
Communication Interdisciplinary  
International Marian Research Institute  
Individual Interdisciplinary Programs  
Teacher Education Interdisciplinary Studies

## JOINT STUDIES

Law and Business Administration (JD/MBA)  
Law and Education (JD/EDU)  
Law Philosophy (JD/PHL)  
Master of Science in Teaching (MST)

## COLLEGE OF ARTS AND SCIENCES

American Studies (AMS)	Philosophy (PHL)
** Biology (BIO)	Philosophy and Law (JD/PHL)
Clinical Laboratory Technology (CLT)	Physics (PHY)
Combined B.S./M.S. Program in Biology	Political Science (POL)
Chemistry (CHM)	Political Science-International Affairs
Clinical Chemistry	Political Science-Public Administration (MPA)
Communication (COM)	Psychology (PSY)
Communication Interdisciplinary	Clinical Psychology
Computer Science (CPS)	Experimental Human Factors Psychology
English (ENG)	General Psychology
History (HST)	Religious Studies (REL):
Mathematics (MTH)	Pastoral Ministries
Mathematics-Applied Mathematical Systems	Theological Studies

## SCHOOL OF BUSINESS ADMINISTRATION

Master of Business Administration (MBA)  
Business Administration and Law (JD/MBA)

## SCHOOL OF EDUCATION

Counselor Education and Human Services (EDC):	Teacher Education (EDT)
Child/Youth Development	Building Leadership
College Student Personnel Services	Computers in Education
School Counseling	Elementary Education
School Psychology	EMR (DH) K-12
School Social Worker	Gifted Education
Social Agency Counseling I	Initial Teaching Certificate (Elementary and Secondary)
Social Agency Counseling II	Interdisciplinary Studies
Educational Administration (EDA)	Learning Disabilities/Behavioral Disorders (K-12)
Education and Law (JD/EDU)	Middle School/Junior High
* Educational Specialist (EDL):	MSPR (K-12)
Leadership	Reading Supervisor (K-12)
Physical and Health Education (EDP)	Reading Teacher
	Secondary Education

## SCHOOL OF ENGINEERING

** Aerospace Engineering (AEE)	Engineering (EGR)
Chemical Engineering (CME)	Engineering Management (ENM)
Civil Engineering (CIE)	Management Science (MSC)
** Electrical Engineering (ELE)	** Materials Engineering (MAT)
Electro Optics (EOP)	** Mechanical Engineering (MEE)

\* This is a Post-Master's Program

\*\* These Programs offer the Doctorate